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ABSTRACT

This congressional report contains testimony examining the status of vocational assistance and its role in work force development and the Clinton Administration's views on reforming the federal investment in vocational education. Testimony was provided by two U.S. senators (James M. Jeffords, Vermont; Edward M. Kennedy, Massachusetts) and representatives of the following agencies and organizations: U.S. Department of Education; American Federation of Teachers; Vocational Education Task Force; National Center for Research in Vocational Education; Information Technology Association of America; New Urban High School Project; Clark-Theders Insurance Group; Center for Occupational Research and Development; and Office of Vocational and Technical Education of the Mississippi Department of Education. The following were among the topics discussed: the adequacy of vocational education policy and practices for the 21st century; the role of community and technical colleges in labor force development; career guidance and counseling services provided through the Perkins Act; proposed changes in the Perkins Act to streamline the vocational education system, improve it, and increase its flexibility and accountability; vocational education funding formulas and financing; school-to-work; national skill standards; business and industry views regrading the role of vocational education and skills

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OVERVIEW OF VOCATIONAL EDUCATION

ED 415 436

HEARING

OF THE

COMMITTEE ON LABOR AND HUMAN RESOURCES UNITED-STATES SENATE

ONE HUNDRED FIFTH CONGRESS

FIRST SESSION

ON

EXAMINING THE STATUS OF VOCATIONAL ASSISTANCE AND ITS ROLE IN WORKFORCE DEVELOPMENT AND THE ADMINISTRATION'S VIEWS ON REFORMING THE FEDERAL INVESTMENT IN VOCATIONAL EDUCATION

APRIL 24, 1997

Printed for the use of the Committee on Labor and Human Resources

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OVERVIEW OF VOCATIONAL EDUCATION

THURSDAY, APRIL 24, 1997

U.S. SENATE,
COMMITTEE ON LABOR AND HUMAN RESOURCES,
Washington, DC.

The committee met, pursuant to notice, at 10:06 a.m., in room SD–430, Dirksen Senate Office Building, Senator James M. Jeffords (chairman of the committee) presiding.

Present: Senators Jeffords, Collins, Warner, Kennedy, and Wellstone.

OPENING STATEMENT OF SENATOR JEFFORDS

The CHAIRMAN. The Committee on Labor and Human Resources will please come to order.

We are here today to talk about an incredibly important subject, and that is the status of our workforce development in this Nation and to find out how we can make it more effective and efficient for its purposes.

This morning's hearing will examine the status of vocational education in this country and the committee's role in workforce development legislation which is under consideration by the committee.

Goal Two of the National Education Goals states that this Nation should reach a 90 percent high school graduation rate by the year 2000. To make that goal a reality, we must improve the education and potential employment opportunities for all young Americans. We have to make high school education relevant to them and give them the knowledge that if they do attend high school, they will graduate with something which enables them to take a good job—and I do not mean just any job, I mean a good job—a job that pays $20,000 or $30,000 or $40,000 a year.

We must provide today's students with an array of learning experiences that will sufficiently prepare them to be active participants in our global economy.

In the 1983 report, a report entitled, "A Nation At Risk" was published. That report raised the following question—whether the United States would have an adequately trained workforce to meet the global challenges of the 21st century. It is now 14 years later, and we have failed to implement strategies that will enable our workforce to meet the standards posed by an ever changing international economy.

Our inaction has been costly as is evident by the following statistics. According to the latest Census information, 22 percent of the population of the United States age 25 and older has completed less than 12 years of schooling—22 percent.

In 1993, a Federal Department of Education study found that nearly half of the adults in the United States were not sufficiently proficient in English to use a bus schedule or to calculate the length of the trip.

A study conducted by the Committee for Economic Development estimates that each year's class of high school dropouts costs over $240 billion in lost incomes and taxes over the lifetime of these students. This study also estimates that an additional $10 billion is spent on paying for crime, drug and prison expenses with each class of dropouts.

One result following the publication of the "A Nation At Risk" report is that we have issued numerous reports pertaining to the status of workforce preparation in education. During President Bush's administration, one report that received considerable attention and still serves as an excellent reference document in setting priorities for vocational education and job training is the SCANS document, or the Secretary of Labor's Commission on Achieving Necessary Skills.

It is my hope that the three key findings of the SCANS document will serve as this committee's guide as we begin drafting the vocational education legislation. These findings are that: 1) education standards must be established which are benchmarked to the highest standards in the world; 2) States should take responsibility for assuring that virtually all students achieve a certificate of initial mastery—I think this is incredibly important; and 3) a comprehensive system of technical and professional certificates and associate degrees should be made available to students and adult workers who do not pursue a baccalaureate degree—and I think we can expand that now even though they get a baccalaureate degree.

Educators, business organizations and Government leaders at all levels of Government agree that we need to restore and restructure our education and workforce preparation delivery system. That consensus must serve as a clarion call to take immediate action.

Some evidence indicates that schools are beginning to respond to increase skill requirements of the new economy. I have seen some of these outstanding examples in my home State of Vermont, such as a privately-funded school-to-work program in Vergennes, VT and a vocational technical center in Essex, which give us at least two examples in Vermont of what should be done. They have IBM standing by, which is a help, let me say. Vermont serves all students ranging from at-risk to adults.

Our goal must be to make every school in this Nation a success story and to sufficiently prepare every student to be an active participant in our global economy. Today's testimony will highlight not only model vocational education initiatives in the United States but will also give us an in-depth view of the vocational education efforts in other nations.

I look forward to hearing from all of our witness, and I now turn to someone who has been out front on these issues for I learned yesterday much longer than I thought—Senator Kennedy.

OPENING STATEMENT OF SENATOR KENNEDY

Senator KENNEDY. Thank you very much, Senator Jeffords.

We are having a very extensive set of hearings on education, and I think it has been of enormous value to the committee. Our hearing yesterday on student aid was enormously important, and today as well, on the future of vocational education is likewise very important. I think that we in New England historically have placed a very high priority on vocational skills. We take a special interest in it, and as we move on through this whole process of reauthorization, we want to find out how we can strengthen it and benefit from some of the really outstanding programs. With the changed workforce that you mentioned, we must revise the curriculum to make it more relevant in terms of the young people who are participating in the program.

So, Mr. Chairman, I thank you very much for having this hearing and for some of the witnesses on today's agenda, whom I will mention quickly in a moment.

As you pointed out, Mr. Chairman, we are confronting the most complex economy in history. As a Nation, we are prosperous, having gained international leadership in economic growth; inflation is contained, national unemployment is low. However, the gap in income between skilled and unskilled workers is widening. For those who enter the workforce with good academic training and well-developed career skills, this new world economy offers unlimited potential. However, for those who lack the basic proficiencies in language, math and science, and who have no career skills, the new economy presents an increasingly hostile climate.

The earning power of the unskilled laborer is steadily declining, and that trend will only accelerate as we move on into the 21st century. What each student learns in school is more determinative today of how he or she will fare in the workforce than it has been at any other time in our history. Vocational education must provide students with the tools that they will require to succeed in the economic environment. Those tools are very different from the vocational training which was sufficient to economically sustain earlier generations. We need a broad-based dialogue about how to reform curricula to meet this challenge. Success will clearly require mastery of both academic and career preparatory skills.

The demands of the modern workplace change far too rapidly for a student to rely on proficiency in a single set of narrow technical skills. Individuals entering the workforce must be proficient in a wide range of communication and analytical skills, often referred to as the SCANS skills. Such skills enable a worker to adapt to the changing demands of his or her profession. The vocational component of the student's education must be broad enough to prepare him or her for all aspects of the industry that he or she is seeking to enter. The academic and occupational components must be fully integrated, as you mentioned, Mr. Chairman. And, most important, both must set high standards to be of real value to the students. Well-designed vocational programs can be of enormous value in a student's development. They inspire students to stay in school and pursue their education. They provide students with a much better understanding of the requirements of the working world. They help students focus on the career of their choice, and they enable students to obtain the educational skills which are required to turn these choices into real careers.

The vocational programs need to be closely tied to other components of the community workforce development network in order to ensure that the school curricula are keeping pace with the ever-evolving demands of the workplace. So it is essential that educators maintain a regular dialogue with business and community leaders. Such linkages also encourage a willingness by employers to directly participate in the educational process.

As we have seen with School-to-Work and Tech Prep, there is great educational value in providing students with hands-on learning in the workplace, and these relationships can be of great assistance to obtaining placements after graduation. We have seen this in Boston and in a number of different places in Massachusetts in the health training area, in financial services, and in areas involving tourism and other broad-gauge industries. There are many schools which are meeting the challenge today, and I am particularly delighted that Assistant Secretary McNeil will cite in her testimony the Fenway Middle College High School in Boston. Also, one of our witnesses today is a Massachusetts educator. Larry Rosenstock, now the director of the Urban High School Project, recently served as principal of the highly-innovative Ringe High School in Cambridge. I have had a chance to visit both of these schools, and I am glad he could be here today to share his valuable insights with the committee.

Massachusetts has been a leader in redesigning its school curriculum to better prepare students for tomorrow. As other States, we are going through a very dramatic change in terms of school reform issues, and that will be going on for the next 2 to 3 years. How we come to grips with this whole area of vocational education will fit into the changing educational climate in our State.

We need to closely examine leading programs from all across the country to more fully understand how best to respond to these new educational demands. The Perkins Act has always served as a catalyst for reform in vocational education, and at this dramatic moment in the evolution of the American workplace, Federal legislation can play that role once more. In order to maximize the impact of vocational education, we need to maintain Perkins as a distinct program with a designated stream of funding. The task before this committee is to design legislation to help all schools better prepare their students for the 21st century.

I look forward to working with the Chairman, Senator Jeffords, and the other members of the committee on this goal.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you very much, Senator Kennedy.

Our first witness is Patricia McNeil. Trish is the assistant secretary for vocational and adult education at the U.S. Department of Education. Prior to joining the Department, she was president of a consulting firm which conducted studies on education and job training programs. Ms. McNeil has also served as director of the Office of Strategic Planning and Policy Development in the employment and training shop at the Department of Labor.

Welcome. It is a pleasure to have you here, Trish. Please proceed.

STATEMENT OF PATRICIA W. McNEIL, ASSISTANT SECRETARY FOR VOCATIONAL AND ADULT EDUCATION, U.S. DEPARTMENT OF EDUCATION, WASHINGTON, DC

Ms. MCNEIL. Thank you, Senator Jeffords, Senator Kennedy, Senator Collins. I feel like I am right at home as a Massachusetts native and a New Englander; I am among friends here. I also have the feeling that I am sort of preaching to the choir, but that is kind of a nice duty sometimes, and I appreciate your having me this morning.

I have submitted my written testimony for the record, but I would like to briefly summarize our ideas for career development in the 21st century.

We do need a new vision, I think, of vocational education if we are going to ensure that students are prepared for the information age. That vision must reflect the rapidly changing demands of our economy and society brought on by new technologies, global competition and changes in the organization of work. Our vision must reflect the knowledge and skills young people will need to be successful in a world that is dramatically different than the one that existed when most of us got our formal education. In short, we must envision new kinds of schools.

I believe it is important that we think about vocational education as an integral part of our efforts to reform secondary schools and improve postsecondary education, and I look forward to working closely with the committee in a bipartisan effort to achieve that objective.

As Senator Kennedy pointed out, the discussions we are engaged in over the need to improve our schools is not new. A century ago, there was a heated debate on how high schools should be changed to reflect the demands of an economy and society moving from an agrarian age to an industrial age.

The Federal Government decided at that time to encourage the creation of distinct programs of vocational instruction when it passed the Smith-Hughes Act of 1917, and over time, most schools sorted students into "academic" and "vocational" tracks, and they added the "general" track in the 1920's.

The question that we must confront today is: Is the vocational education policy and practice of the 20th century sufficient for the 21st century? I believe the answer is an emphatic "No." In the information age, citizens and workers need a combination of strong academic skills, technical skills, and theoretical knowledge. Individuals also need, as Chairman Jeffords pointed out, the SCANS skills, such as information analysis, resource management, and thinking, problem-solving and communication skills.

Whether you are going to be a brain surgeon or an automobile technician, a teacher or a parent, all people in our society are going to need to have that combination of skills.

Too many of our students are simply not getting the skills and knowledge that they need for the future. In a knowledge-based society, the distinctions between academic and vocational preparation and between college-bound and noncollege-bound really no longer serve us very well. This means that high schools and colleges are going to have to produce a new kind of graduate, and our schools and colleges need to change much more rapidly and dramatically

in order to close the gap between what they teach, how they teach, and the knowledge and skills individuals will need to be successful in the 21st century.

As Senator Kennedy pointed out, Federal investment has always been an important catalyst for institutional change. The 1990 Perkins Act began some important changes in the Federal investment in vocational education designed to respond to changing economic and social conditions. With the passage of the School-to-Work Opportunities Act, Congress recognized that every student needs to gain challenging academic skills, have opportunities to explore careers, learn how skills and knowledge are used in out-of-school settings through job-shadowing, internships and work-based learning linked to classroom learning, and be prepared for postsecondary education.

Mr. Chairman, you and Secretary Riley saw these concepts in action recently when you visited Essex Technical Center, and you mentioned that in your opening remarks. When the Secretary came back, he was so excited about the students that he saw and their real commitment to learning at that center. Essex courses integrate challenging academic and technical skills into student projects. It has partnerships with seven colleges to ensure that students have a wide range of postsecondary options. It has 180 business partners. And I must just tell you as an aside that when I was preparing my testimony and sending it through clearance, people said, "One hundred eighty business partners for one school in Vermont? That seems incredible." So that is a very impressive record.

Across the country, vocational education is making a significant contribution to school reform efforts and the development of school-to-work systems. We found some remarkable examples of secondary schools that are committed to ensuring that every student achieves high standards and is prepared for college and a career. We named these schools "new American high schools," because they seemed to represent high schools of the future. These schools have seen test scores go up, dropout rates come down, and postsecondary enrollment rates increase significantly.

One of these schools is Fenway Middle College High School in Boston. Students at Fenway can articulate what is different about their school. They learn about subjects in depth. They create portfolios of their academic subjects that demonstrate a mastery of their learning. In their senior year, they make formal presentations and defend their work in each of six subject areas.

The school has dedicated business partners that provide students with work-based and community learning experiences.

Fenway, a school where 60 percent of the students qualify for free or reduced-price lunch, has a daily attendance rate of 95 percent. And I probably should not tell this story on Tom Payzant, but I actually think that the attendance rate for all——

The CHAIRMAN. He is enjoying it; you go right ahead.

Ms. MCNEIL [continuing]. Is about 55 percent. So that in Fenway, they have a 95 percent attendance rate, and 85 percent of its graduates go on to college.

A little later this morning, you will be hearing from both Larry Rosenstock and David Stern of the National Center for Research in Vocational Education. They are going to talk a little more about

our New American High School and our Urban High School Projects.

We are also seeing some important changes at the postsecondary level. Community and technical colleges serve a broad range of students. They have students who are still in high school, as at Fenway; recent high school graduates; college graduates returning for some specific technical skills, and adult workers returning for retraining or to improve their basic skills.

Community colleges are revamping their curricula and teaching methods and building strong partnerships with high schools, business leaders, economic development agencies, and social service entities. They are leaders in Tech Prep consortia and have a growing interest in school-to-work.

One example of an outstanding community college is Green River Community College in Auburn, WA. This school just won the Department of Education's Tech Prep Award for 1997. It has partnerships with 26 high schools, 200 regional employers and 48 labor organizations.

So how should Federal investment in vocational education be redirected to support these new visions of education that we see at Essex, at Fenway, and at Green River? We believe there is considerable agreement around some core principles which are the foundation of the administration's legislation, and I would just like to briefly discuss some of our ideas in a few of these areas.

First, our proposal would consolidate many of the existing Perkins programs and set-asides. We believe that this would give States and local communities more flexibility to use their resources to better address local needs.

Second, in order to promote program quality, the bill would require that priority be given to schools and consortia with characteristics that lead to quality results for students. These include ensuring that every student has the opportunity to achieve basic and advanced skills and computer and technical skills, promoting the integration of academic and vocational education, linking secondary and postsecondary education, and providing students with opportunities for internships and other work-related experiences linked to classroom learning.

Fifth, the bill would provide career guidance and counseling and effective support services such as mentoring and tutoring and adaptive equipment to help students succeed; building strong partnerships with employers, contributing to education reform, the development of school-to-work systems, and linking with workforce development and welfare reform efforts.

The third thing we hope to accomplish in our legislation is to support the objectives of the Government Performance and Results Act. Our bill would build on the current State efforts to develop performance management systems. It will propose common indicators of performance such as student achievement, completion of high school or recognized industry skill certificates, completion of a postsecondary degree or certificate, and entry into employment.

The Secretary would work with the States and other stakeholders to develop common definitions of core indicators. Right now, we have systems across the country in every State, but few of them use the same definition of student achievement or even entry into

postsecondary education or completion of postsecondary education. So we would like to have a few common, agreed-upon definitions with the States around these important areas.

States would establish challenging goals for improvement which would be considered by the Secretary in a State plan approval process and in determining the Department's progress toward its goals established pursuant to the Government Performance and Results Act.

We also believe that it is critical to ensure that programs receive sufficient funding, and our proposal would authorize appropriations for vocational education basic grants just in fiscal year98 at $1 billion, with $105 million for Tech Prep. To get funds where they are needed most, we propose both a formula that would target money to the State based on population and State income and also a sub-State allocation formula.

Fifth, we believe that Federal investments in career development should support education reform and school-to-work systems-building. Therefore, it is critically important that State agencies accountable for education outcomes have the lead role in planning, administering and making decisions relevant to these resources, and that an educational agency or agencies in the State, consistent with State law, continue to administer the program. Each State plan would be approved by both the State education agency and the State agency responsible for community colleges and submitted to the Secretary after review and comment by the Governor. States would also be authorized to reserve funds for State leadership activity.

Finally, the bill would streamline and strengthen national program authority. Our proposal would include a national center for research on education and careers, and a new national assessment on how secondary and postsecondary schools are preparing students for careers in the future.

We would also use these resources to support investments in professional development, improvements in curricula and assessment, the use of technology to enhance learning, and the development of effective performance management systems.

Again, I look forward to working with the committee on all of these issues, and I will be happy to answer any questions that you may have.

[The prepared statement of Ms. McNeil follows:]

PREPARED STATEMENT OF PATRICIA W. MCNEIL

Chairman Jeffords, Senator Kennedy, and members of the committee: Thank you for the opportunity to appear before you today to discuss the administration's views on reforming the Federal investment in vocational education. We need a new vision of vocational education if we are going to ensure that students are prepared for the information age of the 21st century. That vision must reflect the rapidly changing demands of our economy and society brought on by new technologies, global competition, and changes in the organization of work. Our vision must reflect the knowledge and skills that workers, citizens and family members will need to be successful in a world that is dramatically different than the one that existed when we got our formal education. In short, we must envision new kinds of schools.

I look forward to working closely with this committee in a bipartisan effort to reshape the Federal investment in vocational education to meet these challenges. I believe it is important that we think about vocational education as an integral part of our efforts to reform secondary schools and improve postsecondary education.

The debate we are engaged in is not new. A century ago, there was heated debate over how high schools should be changed to reflect the demands of an economy moving from an agrarian base to a manufacturing base. Until that time, children received a common core curriculum of academic subjects; most left school before the end of eighth grade. In 1900, the size of the Nation's high school graduate class was only about 6.5 percent of the high-school-graduate age population (compared to about 72 percent in 1994).

That system worked for an agrarian economy, but educators, parents, and business and labor leaders felt it was inadequate for the emerging manufacturing economy. Some policy-makers proposed setting up separate vocational education programs to prepare young people for work. Others, most notably John Dewey, urged the integration of academic and vocational instruction so that all students could learn the same academic material, but do so in the context of occupations and other "real world" experiences. The Federal Government came down on the side of creating distinct programs of vocational instruction when it passed the Smith-Hughes Act of 1917. Eventually, most schools sorted students into "academic" and "vocational" tracks. In the 1920s, many schools added a general track to give students a little bit of both. Although commissions and studies throughout the 20th century have suggested that the Nation's approach to vocational education needs to be reconsidered, most schools and school districts have considered vocational education a separate track designed primarily to prepare students for work.

The question we must confront today is: Is the vocational education policy and practice of the 20th century sufficient for the 21st century? The answer, I believe, is an emphatic NO. As we enter what Peter Drucker calls the "knowledge society," citizens and workers will need a combination of strong academic skills, technical skills, and theoretical knowledge. Individuals also need what have come to be known as the SCANS skills, that is, information analysis, resource allocation, interpersonal skills, and thinking, problem-solving, learning, and communication skills. Brain surgeons, automobile technicians, teachers, parents homeschooling a child—all need a combination of these skills to participate fully in the information economy. Lester Thurow notes the rapid growth of "brainpower" industries such as microelectronics, biotechnology, and telecommunications. He points out that, while natural resources determined economic prowess in the 20th century, "brainpower will be the competitive advantage for individuals and firms" in the information age.

These changes are not only being felt in emerging industries. Our traditional manufacturing and service firms are also feeling their impact. There is no more dramatic example than what has taken place than in the automobile industry. In just 5 model years, from 1990 to 1995, the percentage of the average car's operating components that were electronic rose from 18 percent to 83 percent. There are about 80 computer chips in our 1997 model cars. If you tinker under the hood of these cars, you are likely to knock out an operating or guidance system costing $300, or much more. Recently, I spoke with a high school student at the dealership where he was in an internship. I asked him what level of math he thought he needed to be a competent auto technician. Without hesitation he replied "algebra 2." His mentor—a master technician—noted that an associate's degree is essential to move up the career ladder in the industry. Even with an AA degree, he needed to return continually to school to acquire new academic, technical, and theoretical knowledge.

With the changing skill demands, many high school graduates are ill-equipped for entry-level jobs. From studying the hiring practices of several modern automobile manufacturing and insurance companies, and comparing the qualifications of entry-level employees to the scores of 17 year-olds on the National Assessment of Educational Progress, authors Frank Levy and Richard Murnane concluded that nearly half of the 17 year-olds in the Nation do not have the basic academic skills to get an entry-level job in these firms.

Our students simply are not getting the skills and knowledge they need for the future. No longer can our students succeed with only academic or only technical skills. Students need a combination of academic skills and technical skills, and the ability to keep on learning throughout a lifetime. In the information age, the distinctions between academic and vocational preparation and between college and non-college bound no longer serve us well. This means that high schools and colleges are going to have to produce a new kind of graduate.

Our educational institutions have been trying to respond to the challenge. More students are going to college than ever before, taking advanced placement courses, using computers, and gaining more advanced skills in technical courses. In 1994, 50 percent of all vocational education graduates went on to college. But this is not enough. Our schools and colleges need to change much more rapidly and dramatically in order to close the gap between what they teach, how they teach, and the knowledge and skills our citizens need to be successful in the 21st century.

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For these reasons, President Clinton has called for all children reading independently and well by the end of third grade, all students knowing algebra by the end of eighth grade, and all students prepared for and having the resources for college by the age of 18. He has called on States to develop high standards and good assessments, connect schools and students to technology, promote strong and safe schools, and support good teachers in every classroom.

Federal investment has always been an important catalyst for institutional change—from the Land Grant College Act in 1862 to the Smith-Hughes Act of 1917 to the Elementary and Secondary Education Act of 1965. With the Carl Perkins Vocational and Applied Technology Education Act of 1990, Congress began to make some changes in vocational education designed to respond to the changing societal and economic conditions. The Act promoted the integration of academic and vocational learning. It required that each State use academic achievement as a measure of success. It encouraged linkages between secondary and postsecondary course work through tech-prep education. It moved away from narrow occupational skills development and emphasized exposing vocational students to all aspects of an industry.

With passage of the School-to-Work Opportunities Act, Congress recognized that every student needs to gain challenging academic skills, have opportunities to explore careers, and learn how skills and knowledge are used in work-related settings through job shadowing, internships, and work-based learning linked to classroom learning. It affirmed that students need safe, supportive learning environments by emphasizing opportunities for youth to work with adult mentors. Far from watering down curricula or narrowing career options, the School-to-Work Opportunities Act envisions high standards, preparation for postsecondary education, awarding of certificates recognizing the skills students achieve, and helping students make smooth transitions from high school to college, from college to careers, or from high school to careers with the skills needed to continue their schooling. Republican and Democratic governors, legislators, and community leaders are recognizing the importance of these ideas in improving schools and helping students gain 21st century skills and knowledge.

Mr. Chairman, you and Secretary Riley saw these concepts in action recently when you visited one of Vermont's outstanding schools, the Essex Technical Center, in Essex Junction, which received Perkins Act funds and is part of the Lake Champlain school-to-work collaboration. Essex offers a variety of courses that integrate challenging academic and technical skills into students' projects. It has partnerships with seven colleges to ensure that its students have a wide range of postsecondary education options. It has 180 businesses involved with its students and programs. Secretary Riley told me how impressed he was with his conversations with students in the computer drafting and dental programs and their enthusiasm for learning.

Across the country, vocational education is making a significant contribution to school reform and school-to-work efforts. Because a significant percentage of vocational education State grants, tech-prep activities, and school-to-work activities are in the secondary schools, we have been looking at how communities are using these Federal investments to improve student achievement at the high school level. With the help of the National Center for Research in Vocational Education, we identified about 30 schools that we call "new American high schools." They represent the range of public education in the country: large comprehensive high schools, charter schools, restructured vocational-technical centers, career academies, and magnet schools. These schools are committed to high academic standards for every student and to ensuring that all their students have the knowledge and skills to pursue postsecondary education. They provide the opportunity for all students to explore careers, gain technical skills, and do community or work-based learning. They use technology to enhance learning and create safe, supportive learning environments. They also stress parental involvement, have strong business partnerships, and work closely with postsecondary institutions. These schools have seen test scores go up, dropout rates come down, and postsecondary enrollment rates increase significantly.

One of these schools, Fenway Middle College High School in Boston, MA, is located on the campus of Bunker Hill Community College. Fenway sets challenging academic standards for its students—60 percent of whom are eligible for free or reduced priced lunch. Students you meet at Fenway can articulate what is different about their school. They learn about subjects in depth; they have the chance to figure things out for themselves; they see how academic and technical skills are used in the workplace through internships; and they care about what they are learning. They work in groups to solve problems. They create portfolios in their academic subjects that demonstrate mastery of their learning. In their senior year, they make formal presentations and defend their work in each of six subject areas. Throughout their education, they form close relationships with adult mentors at one of the

school's dedicated business partners: CVS Pharmacy, the Boston Museum of Science, and Children's Hospital. The business partners work hard to provide students work-based and community learning experiences that students are interested in. For example, students working with CVS may be interested in pharmacy, but they may also explore the retail, management. or accounting functions within the company. The purpose of these experiences is not to train students for jobs, but rather to enhance learning and expose them to a broad range of opportunities. Fenways daily attendance rate is 95 percent, and 85 percent of its graduates go on to college.

At the postsecondary level, community and technical colleges serve a broad range of students: students who are still in high school, recent high school graduates, college graduates returning for some specific technical skills, adult workers returning for retraining, welfare recipients, and adults with limited basic skills trying to get a foot on the economic ladder. Community colleges are revamping their curriculum and teaching methods, and building strong partnerships with high schools, business leaders, economic development agencies, and social service entities. They, too, are redesigning vocational education to respond to the needs of the information age.

So how can the Federal investment support a new vision of vocational education? We believe it is important to align vocational education with education improvement efforts in secondary schools and postsecondary institutions. Federal investments can help to ensure that secondary students (1) have opportunities to learn about and explore careers and obtain the skills and knowledge needed to pursue them; (2) gain computer and other technical skills, (3) have access to up-to-date equipment in school and through work-based learning experiences, and (4) make smooth transitions to college and careers. Federal investment can ensure that college students (1) gain advanced technical skills and academic knowledge, (2) are prepared for careers, and (3) can make transitions to degree programs in four-year colleges and universities.

We believe there is considerable agreement around certain core principles for reform of vocational education legislation:

- Dramatically reduce the number of separate programs and set-asides.
- Provide States and schools with more flexibility by providing for waivers and eliminating prescriptive provisions.
- Promote high standards for learner achievement, including both academic and technical skills achievement.
- Promote program quality by establishing quality-based priorities for program funding.
- Include strong accountability provisions and a system of performance goals and indicators using common definitions developed collaboratively with States.
- Target funds to States and local areas with the greatest need.
- Promote strong partnerships among business, secondary and postsecondary institutions, and workforce and economic development systems.
- Support and become part of education reform and improvement efforts.
- Support the integration of vocational education in the school-to-work framework.

Streamlining and flexibility

Our proposal would consolidate the many existing Perkins Act programs. Under our proposed State grant program, States could continue many activities authorized under current law, such as programs for displaced homemakers and programs for incarcerated youth.

Opportunities for program quality

Our proposal would establish program priorities to focus Federal support on program quality. The bill would require States and local recipients, in making decisions about grants and services, to give priority to programs that have the characteristics that lead to quality results for students. These characteristics include ensuring that all students have the opportunity to develop a combination of strong basic and advanced academic skills; computer and other technical skills; theoretical knowledge; and communications, problem-solving and teamwork skills. They include promoting the integration of academic and vocational education; providing students with experiences in all aspects of industries: and linking secondary and postsecondary education.

They include providing students with opportunities for internships and other work-related experiences linked to classroom learning; providing career guidance and counseling, and offering support services, such as adult mentoring opportunities, tutoring and adaptive equipment to help students succeed. Priority would also go to those that build strong partnerships with employers; use technology to entice learning; and link career preparation to education reform efforts, school-to-work opportunities systems, workforce development, and welfare reform efforts.

Accountability

In response to the 1990 amendments to the Perkins Act, States have created and implemented State-based performance standards for their vocational education programs. At this time, the content of these performance systems, and how States use them to improve program quality, widely vary. The Department has begun working with the States to establish core indicators of performa. Our proposal would build on the current State efforts to build performance management systems. It would require the identification of program goals and expected levels of performance. The Secretary would work with the States and other stakeholders to develop common core indicators. States would establish challenging goals for improvement, which would be considered by the Secretary in the State plan approval process and in determining the Department's progress toward its goals established pursuant to the Government Performance and Results Act.

We propose to increase the use of this information to improve program quality by authorizing States to work with or sanction its grantees that do not meet their performance objectives, as well as owing them to use State leadership funds for performance incentive grants to local programs that provide exemplary services. Our proposal would authorize the Secretary to work with or sanction poor-performing States and to make awards for national excellence to States that provide exemplary services.

Formulas and financing

As school enrollments increase, the Department believes it is critical to ensure that education programs receive sufficient funding and that Federal funds are effectively targeted. Our proposal would authorize appropriations for fiscal year 1998 at the level requested in the President's budget, including $1 billion for the State grant and $105 million for tech-prep education.

To get funds to where they are needed most, we propose using a formula to distribute basic grant funds to States, based on population and State income, and to require States to distribute funds to local communities and institutions based on specified formulas. While our proposal would provide States some flexibility in how they allocate funds to local areas, we believe that there is a strong Federal interest in promoting equity that makes it necessary for States to take into account the enrollments and poverty in local areas when distributing Federal funds.

Because it is critically important for the State agency accountable for education outcomes to have the lead role in planning, administering, and making decisions relevant to the resources for which they are accountable, an educational agency or agencies in the State, consistent with State law, would continue to administer the program. Each State's program would be based on a State plan developed by the responsible education agency in the State and approved by the State educational agency and the State agency responsible for community colleges and submitted to the Secretary after review and comment by the Governor.

To further ensure that States can effectively meet their responsibilities for this program, our proposal would continue to allow States to retain a small percentage of their grants for State leadership activities, such as professional development, curriculum development and dissemination, career guidance and counseling for students, educational technology, and supporting vocational student organizations. These State leadership activities are the source of innovation and improvements in vocational education and allow States to coordinate their vocational education strategies with other education and training initiatives.

National activities

Investments in research, development, technical assistance, and evaluation at the national level have historically been extremely important. The Perkins Act, however, authorizes many very narrow and specific national programs, most of which have never been funded. Our proposal would streamline the national programs authority and create the flexibility to address new issues as they arise. Our proposal would continue to authorize a Center for research on education and careers. It would authorize a new assessment of how secondary and postsecondary schools are preparing students with the academic and technical and related skills needed for the 21st century. The balance of our national activities will support strategic investments to improve student achievement at the secondary and postsecondary level, including investments in professional development, improvements in curriculum and assessment at the local level, innovations in career information and guidance, student support services, and the use of technology to enhance learning. The development of effective performance management systems, building strong partnerships between schools and business, between secondary and postsecondary schools, and among parents, students and schools, as well as support for comprehensive high school and community college reform efforts are other areas we support.

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Again, I look forward to working with you and your colleagues on legislation that will take vocational education into the 21st century. I would be happy to respond to any questions you may have.

The CHAIRMAN. Thank you, Ms. McNeil, for your helpful testimony.

In your testimony, you mentioned that you have begun working with the States to establish core indicators of performance. Would you please elaborate on this process and address the following issues: How many States are you currently working with? Do you have any mechanisms in place that will encourage States to participate in this process, and how is your vocational core indicators plan being coordinated with overall school reform efforts?

Ms. MCNEIL. OK, in my old age, I may have to ask you to repeat some of those, but let me start and tell you where we are on this.

The 1990 Perkins Act did require each State to set up a performance management system, and interestingly, the one element that it required all States to have was around academic achievement. So that element is consistent across States, but the definition of what that constitutes is not necessarily consistent across States right now.

When the Government Performance and Results Act was passed, it told us that we have to have submitted with our 1999 budget a plan—really, a set of objectives and indicators—that would show success, or what would represent success, for the Federal investment in vocational education. And the Department of Education this year, as part of its 1998 submission, did send you some preliminary ideas about what we would set as goals and objectives for vocational education.

Well, that triggered a process for us, both the development of those national indicators and objectives, of getting together with the State directors, and we have been working with the Association of State Directors of Vocational Education on this, to start talking to them about how we needed to work together to align some of the indicators in these varied State performance systems around some common definitions.

So we have begun a dialogue with them, and this includes all the State directors, so that is a broad-based dialogue that is ongoing.

We have a couple of other things going on. We have a project now that is trying to align vocational education and school-to-work performance measures in a number of States, and we have a third project, working with several consortia of States, to get them to come up with some common measurements of academic and skill standards that are needed in the manufacturing industry and in the health industry.

Of course, we are also working with the National Skill Standards Board, and we are working internally within the Department to be sure that the academic standards that are set for vocational education students are exactly the same as those for all students. I think that is absolutely critical. So those are some of the things that we have underway right now to try to align the performance standards.

I think we are not going to wait for this bill to be passed. We have gotten a very strong reception from the States, a very positive

reception from the States, of working collaboratively with us on this project.

The CHAIRMAN. I just cannot express more deeply my concern that we are still just beginning to try to find out what is going on, and it has been 14 years. I am hopeful that we can really make a concerted effort, all of us, to make real movement.

You mentioned, as we all do, that we have examples of good schools here and there. Does every State have one good program?

Ms. MCNEIL. Every State has a lot of good programs. I think that what we——

The CHAIRMAN. Every State has a lot of good programs?

Ms. MCNEIL. Well, in Vermont, would you say——

The CHAIRMAN. I think we have one real good one.

Ms. MCNEIL. OK, and that would be Essex.

The CHAIRMAN. Yes. I am talking about real, top, good programs.

Ms. MCNEIL. OK. That would be Essex. I think you can go into some of the bigger States, and you can see—I guess the point I was trying to get at is that you can see individual programs. Even in a school where maybe not everything is going well for all students, you may come across that gem of a program that is working for 20 or more students.

Where I think we have not been making progress is getting schools, whole schools, to really develop quality initiatives for all of their students. This is why we got so interested in going around the country, looking for examples of high schools where that was taking place.

We came up with about 30 schools—now, I am not saying that that is the universe—but we came up with about 30 high schools that were really engaged in whole school reform where you could go into those schools and see that all of the students in those schools were making academic progress, were achieving challenging technical skills, were really being prepared for the future.

So I guess the distinction that I am making is that we can find and point out a number of very good small programs in a lot of different areas—at a community college or at a high school or at a technical institute. It is getting to critical mass that I think is our big challenge right now.

The CHAIRMAN. I also want to go for a moment to our City of Washington. I think we have a special responsibility to do what we can, and little is being done. I would like to take a look at the whole metropolitan area. It seems to me that you and I and Members of Congress ought to be able to work together to demonstrate what can be done if you have the resources and if you put them to work. So I am going to be pushing that, and I will be announcing a program shortly to try to do that. I know we have talked about it, but I think that we cannot wait any longer to get some good, solid demonstration programs, especially in a labor market area like ours—there are 17,000 jobs out there, $20, $30, $40 an hour jobs, that we are not providing the skills for.

Ms. MCNEIL. I could not agree more with you, and we really look forward to working with you on that. We have just done a review of both vocational and adult education in the District. What is striking to me is that you can go out to Fairfax County, to Thomas Jefferson School of Science and Technology, which uses quite a bit

of Perkins money, and you can see outstanding examples of the most modern, up-to-date vocational, technical and academic education going on in that school, and this is right in the same area, and there is very little of information across geographic lines there.

The CHAIRMAN. Thank you.

Senator Kennedy.

Senator KENNEDY. Just to follow along, and this is a tangential point, but the immigration law provides for 140,000, and we have 100,000 who come here every year having completed probably 2 years of college and some skills under the labor regulations. We have 60,000 who are admitted into the United States without any kind of testing; they are called "temporary," and they stay here for 6 years. They are coming here, displacing Americans, or the Americans are not being trained. I think we need those who come in who are the best and the brightest and can help to expand the American economy and expand jobs, and they ought to come in. But they actually compose a rather small percentage. We are bringing in people with skills that we ought to easily be able to develop programs for, and that impacts the total numbers in terms of immigrants. I would like to talk with you again about that at another time.

I would be interested specifically, picking up on Senator Jeffords' questions, about the skill standards. Where are we in terms of skill standards? We passed that, and I am always listening to the chairman here talking about accountability, objectives and goals, all of which we should obviously be more attentive to in terms of convincing American taxpayers that these resources are going someplace where they are making a difference in people's lives. But where are we really in terms of your own Department?

Ms. MCNEIL. OK, two things. First, we started with the Department of Labor several pilot projects on skill standards development, and most of those are complete now, and their materials are out and available for schools to use, and they are in a wide variety of areas. That was sort of the preliminary salvo, if you will, to the work of the National Skill Standards Board. I sit on the Skill Standards Board for Secretary Riley, and they have been working for about a year and a half now. They have a framework now for skill standards and are about ready to go out with competitions in a number of areas to really start the more formal development of skill standards.

So they are making good progress, and we are working with them collaboratively on a number of projects, one of which is the one I mentioned earlier, which is really working with States to look at what academic and technical skills are made in manufacturing and in the health services industry.

So it is a challenging job, and as you know, the whole purpose here is to get industry to adopt these standards. I think the Skill Standards Board has been doing an excellent job of working closely with industry to get a framework that will be useful to industry and also useful to education.

Senator KENNEDY. And is there reluctance to move along those lines, or is it welcome—how would you interpret the reception, generally?

Ms. MCNEIL. I think that most industries in the country recognize, certainly, the need to have well-qualified workers, and they are disturbed that the individuals who are graduating from high school and postsecondary institutions do not have the range of skills that they feel are important for the future. So I think that there is a real interest among the business community in ensuring that schools and students know what is expected of them and what skills they are going to need in the future.

I think that when you get down to doing the mechanics of skill standards, then it is really important to go through a consensus-building operation, because it is no good to have them if industry is not going to buy them or if students and schools and their parents do not think that they make sense.

So this is a lot of what the Board has been trying to do is build this consensus, and I think we have found in our own projects, the pilot projects that we did, that it was an ongoing process to get business involved, and large numbers of business people involved, and then support the work that a smaller group of people had done. But our early pilot projects are working very hard on that and seeing, I think, some good response from business.

Senator KENNEDY. Could you elaborate a little bit on vocational education and school-to-work and how you see the relationship between those programs?

Ms. MCNEIL. Yes. School-to-Work was really passed as sort of an umbrella. It was a recognition that every student needs to have an opportunity to gain high academic skills, to gain technical skills, career exploration, be prepared for college and careers. It was really part of a school reform effort. It covers, somewhat controversially in some places, but it really starts in early grades with just some basic career exploration and going on field trips to visit your father's business or the police station, up to high school, where students get into taking more rigorous courses, and then on to postsecondary. It also covers out-of-school youth.

Vocational education is an important contributor to the development of school-to-work systems. It provides career exploration, it provides technical skills training, it provides hands-on learning. It is confined primarily to high schools and postsecondary; it does not reach below high school, and it does not reach too many out-of-school youth. It is pretty much an in-school program. So it contributes to the development of school-to-work systems.

Tech Prep in particular has been a very, very important building block for school-to-work systems because it has done the most work in integrating academic and vocational instruction and developing those real, solid linkages between secondary and postsecondary course work.

So we see it as a very important foundation for developing school-to-work systems.

Senator KENNEDY. There was a very interesting conference up in Boston a couple of weeks ago where we heard from students involved in school-to-work students who at first may not have been interested in academics, but once they began to learn in the context of career skills, the impact on their academic achievement was just incredible.

Ms. MCNEIL. It is true.

Senator KENNEDY. We should not be surprised, but it was virtually uniform across the board, and the interest and the excitement generated by making education relevant for these kids is really inspirational.

Ms. MCNEIL. Absolutely, when you hear a kid say, "I thought I was a failure. I thought I could not do math. I did not know where I was going, and all of a sudden the light came on, and now I can do algebra."

I went to an automobile dealership recently where there was a young student who was interning as part of a high school program. I asked him, "What level of math do you need to do this work?" and without hesitation, he said, "Algebra II." I was not sure I actually remembered what Algebra II was all about, but I knew it was important.

Senator KENNEDY. It was awfully hard, I remember.

Ms. MCNEIL. And he said, "In my wildest dreams, I would not have thought about being able to do Algebra II, but now that I am working, and I see how it is used, the lights have come on, and I understand this, and I am very enthusiastic, and now I am thinking about going on to postsecondary and becoming a master technician."

Senator KENNEDY. I have other questions, but I know others wish to inquire. Should worksite-based learning become a standard component of the vocational education program?

Ms. MCNEIL. Absolutely, yes. We see more and more vocational education programs, Tech Prep programs, adopting worksite learning. It really enriches the students' experience.

Senator KENNEDY. How we do that will be a bit of a challenge, and we will need some help as to how to do that in a graceful way.

Ms. MCNEIL. We think that that should be one of the key priorities that we look for in a quality program, and that is how funding should be directed, to programs that are going to be using internships and work-based learning.

Senator KENNEDY. Finally, what should be the responsibility of the high schools to assist graduates who are not going on to college in obtaining employment?

Ms. MCNEIL. Well, it is very interesting today because I have seen this in so many programs that I have gone into where young people have no aspirations of going on to college, but when they get into these programs and find out that they can actually accomplish a lot of what they did not think—especially on the academic side—what they did not think they could do, their aspirations change, and that is important, because in the example I gave about becoming an automobile technician, this young man's mentor at the dealership said that in order to move up the career ladder, even though he came into the dealership right out of high school, he had gotten an associate's degree and was continuing to go to school.

So it is really a matter of two things. For young people who do not want to go on to college right away, I think it is linking them up—and I think you can do this through work-based learning—with employers who are willing to hire them for entry-level jobs because they are qualified right out of high school. But almost always, those employers are going to expect a young person to go back to school at some point; in fact, some employers now are so

excited about these young people that they are willing to pay and help subsidize the cost of postsecondary education.

So I think we should be making the links for young people who do not want to immediately go on to college with employers, and employers in their field of study, and I think you can do that through internships and work-based learning and working closely with employers around curricula.

But I also think it is important that we prepare all young people to go on to postsecondary education because I think it is going to be expected of them throughout their working lives.

Senator KENNEDY. Thank you very much. Is the administration going to send a bill, or are you going to work with us on a bill?

Ms. MCNEIL. We are hoping to send a bill. We have one in draft right now, and I hope that within the next 2 or 3 weeks, we will have a bill for you, but we of course also want to work with you as you are developing you bill.

Senator KENNEDY. Senator Wellstone, who is the ranking member on the Subcommittee on Employment and Training, was here, but they are having important hearings on the floods over in the House, so he is necessarily absent. But he is very interested in this.

Ms. MCNEIL. Thank you.

Senator KENNEDY. Thank you, Mr. Chairman.

The CHAIRMAN. Senator Collins, thank you for being here. Please proceed.

Senator COLLINS. Thank you, Mr. Chairman.

Ms. McNeil, I enjoyed your testimony and found it very interesting. I have become increasingly convinced that the increasing gap that we are seeing in this country between the rich and the poor is really an education gap and that if we are going to try to lessen that gap, we need to encourage people to get the skills and the education that they need.

I was struck when I was campaigning in Maine last fall by a conversation that was typical of conversations that I had with employers who told me that they could not find people who had the skills that they needed for the jobs that were available. One conversation in particular struck me. A factory owner in Rockland, ME told me that he interviewed 80 people with high school degrees before he could find one person who had the high school math skills that he needed for the job. That was so startling to me because that means that despite the great innovations that we can all point to in our States, we are really failing those students who do not go on to postsecondary education, and we are not giving them the skills that they need.

So that much of what you have outlined, I certainly agree with. One issue, though, that we need to struggle with as we consider reauthorizing the Perkins Act and other related laws is to sort out the roles and the responsibilities of the Federal Government versus the State government and versus local communities, teachers, parents, and employers. I do not think that that is that easy of a task. I want to explore with you for just a few moments your concern about performance standards and increased accountability.

All of us want to make sure that Federal dollars are wisely spent and that they are not wasted, and certainly accountability is critical. But I am concerned that some of the mechanisms that you de-

scribe, even though you describe a collaborative approach in developing them, could also mean unnecessary Federal control or regulation of State and community programs.

For example, will the State plan that would be submitted to the Secretary only be for information purposes, or would the Secretary of Education actually approve the plan?

Ms. MCNEIL. We would anticipate and think it is important that the Secretary of Education approve the plan. We are real sensitive to this issue of Federal-State relationships and local and State control over education, absolutely.

In the past, and in our bill, basically, the requirements for performance really apply to the Federal investment in places where there are Federal dollars being invested in vocational education.

What is interesting to us is that this was in effect in 1990 when we really began this development of performance measurement systems, and a lot of States chose to go ahead and extend their performance management systems to their entire vocational education enterprise. But that is a State choice.

What we are primarily focused on are schools and programs that receive Federal funds, and we think it is appropriate that the Federal Government get a return on its investment and know what that investment has produced. But as I said, at the same time, we are really sensitive to the fact that States and localities are responsible for education in this country.

So this is why we have really been approaching this in a collaborative way, and I am certain, based on my conversations with the State directors, with whom I meet about three or four times a year, that collaboratively, we can come up with a system around some core indicators that will be mutually agreed upon by us and by the States.

Senator COLLINS. When you talk about "core indicators," how does that really differ from setting national standards?

Ms. MCNEIL. Well, basically, it is sort of like the business model right now, where businesses are saying, We produce products, and we want to see that those products are well-made, and we want to know what our results are when we go out to the marketplace.

What they do now is ask, Where are we now in terms of results and outcomes. Well, the State of Maine may be one place, and the State of Vermont may be someplace else. So that really is your baseline. It is not like there is a national baseline. Maine and Vermont may have very different baselines as to where they are in terms of number of students graduating from high school, number of students achieving high levels of math skills.

You would set some challenging goals for what Maine would want to achieve particularly with its Federal investment in vocational education dollars, and those would be goals that you would choose. I guess if 75 percent of your students graduated from high school, and you chose 76 percent, in 10 years, maybe you would ask is that really challenging enough. But basically, I think States want to improve, but they do not want to be held to one national standard that may be artificial for Maine or for Vermont, and I think that what we are trying to do here is look to a continuous improvement model of performance management that both gives you the information you need to know whether the Federal invest-

ment has been worthwhile but also recognizes that States and localities start from different points and have different objectives.

Senator COLLINS. I guess I would encourage you to rethink some of that, even though I totally agree with you that we have got to make sure that Federal funds are wisely spent, but when I hear you describe a situation where States plans actually have to be approved, that implies a degree of Federal control that raises a concern for me.

Similarly, in your testimony, you say that the administration's proposal would authorize the Secretary to sanction poor-performing States, and I am not sure exactly what you mean by that. Could you expand on that?

Ms. MCNEIL. Well, let me just say one thing. Right now, we do approve State plans. We have had one instance, actually, with the District of Columbia, where they totally de-funded their adult education program, and we did withhold money, and we did do some negotiations with them around what they would actually use the Federal investment in adult education for. Now, we are making some progress on that. It very rarely happens, but we do this now, so it would not be a new procedure for the States to have their State plans approved by the Secretary. That is not something new.

I am sorry—remind me of the second part of your question.

Senator COLLINS. The sanctioning of poor-performing States, which I think you just partially answered.

Ms. MCNEIL. Primarily, what we would do usually is withhold money for a while until we could work out—just find out exactly what the Federal investment was going to be. It rarely happens, but I think it is an important tool.

Now, I think that in sanctioning, to be perfectly honest with you, there is an issue of political will here which is always operating. I think that what this would do would be to give the Secretary the opportunity to withhold the money if a State were really poorly performing or abusing the Federal investment. I have rarely seen it happen, and Senator Jeffords and I have probably been here in Washington for about the same length of time, and I do not know if he can recall it ever really happening, but I think that it is an important statement that there are some penalties if you abuse this Federal investment.

Senator COLLINS. Just one final comment on this issue because I think it is an important and difficult one. My concern really—and I understand why you might withhold funds in the case that you describe—but I really want the Federal Government to be responsive and sensitive to the fact that the 50 States are very different from one another.

Ms. MCNEIL. Yes; I totally agree.

Senator COLLINS. And Maine ranks 49th out of 50 in the number of high school students who go on to postsecondary education. That is an appalling statistic, and it is one that we are working hard to try to improve. That is something that Maine really ought to work on, and I am just worried about you coming up with core standards that do not respond to the State and local realities and that really circumscribe the use of Federal moneys in ways that make it difficult for State governments to respond to what truly are the needs in that State.

Ms. MCNEIL. I would absolutely agree with you. I do not see the Federal Government setting an enter postsecondary education rate of, say, 50 percent. I think that Maine might say, "Well, we are now at 25 percent; we would like to get it up to 40 percent over a period of time. We are going to set that as our goal, and we are going to have some benchmarks for getting there." Another State that has very high levels of college-going among their high school students may set a much higher goal than Maine because it is already higher than Maine is. I think that that is the kind of flexibility we would like to have in this, with States setting their own goals—the goals would need to be challenging, but they would be different. The goals that Maine would set in terms of college-going may be different from another State—Vermont or Massachusetts—and that is the kind of flexibility we would like to see in the system.

Senator COLLINS. Thank you.

Ms. MCNEIL. And I would be more than happy to come up, and we can talk a little bit more about this and talk about some of the details that we have in mind on it.

Senator COLLINS. Thank you very much.

The CHAIRMAN. I just have one additional comment on the skills panel. I believe it was created in 1994.

Ms. MCNEIL. Yes.

The CHAIRMAN. I met with them last year, and I got all sorts of promises that things were really going to move along, and I still do not have a single skill standard. I think they have had something like $20 million.

Ms. MCNEIL. I do not know if they have had that much.

The CHAIRMAN. But there is something wrong.

Ms. MCNEIL. First of all, I think it would be good, and I will suggest, that their chairman and their director come up and talk with you and your staff about this, because I think you need to understand the process that they have come to.

The CHAIRMAN. I met with them last year, and it was an excellent meeting, and all sorts of expectations were created.

Ms. MCNEIL. They came up with one framework for skill standards, and they took it to the business community. The business community had suggestions for them. They went back and refined it, and I believe they are——

The CHAIRMAN. OK. Well, I will be waiting with baited breath. All right. Thank you very much.

Ms. MCNEIL. Thank you, Senator Jeffords.

The CHAIRMAN. Our second panel consists of David Stern, Harris Miller and Paul Cole. I would like to note that Nancy Alley, from the State Vocational Education Office in Mississippi, was scheduled to testify and due to illness is unable to be here this morning. I had an opportunity, incidentally, to visit Mississippi's vocational education program last year and was amazed at the entire State's creativity, dedication and commitment to vocational education, and I hope we will be able to have her with us at some time in the future.

David Stern is currently director of the National Center for Research in Vocational Education. Prior to his position at the National Center, Dr. Stern was an assistant professor at Yale Univer-

sity. He is also co-author of "School-to-Work Policy Insights from Recent International Developments." I want to especially thank Dr. Stern for his effort to get here, taking the "red eye" flight from California, and I hope he can stay awake. We certainly will, anyway.

Harris Miller is currently president of Information Technology Association of America. He is the author of a report that has received a great deal of attention from this committee. The report is entitled, "Help Wanted: The International Technology Workforce at the Dawn of the New Century." Prior to working in the private sector, Mr. Miller held a variety of Government positions including a stint as a legislative director in the Senate.

Paul Cole is vice president of the American Federation of Teachers and the chair of that organization's committee on vocational education. Prior to working for AFT, Mr. Cole spent 23 years as a teachers and as past president of the New York City Council on Vocational Education. He is currently a member of the New York State Education Department's Curriculum and Assessment Council and the State Job Training Council.

Welcome. Mr. Cole, why don't we start with you?

STATEMENTS OF PAUL F. COLE, LOUDONVILLE, NY, VICE PRESIDENT, AMERICAN FEDERATION OF TEACHERS, AND CHAIR, VOCATIONAL EDUCATION TASK FORCE; DAVID STERN, DIRECTOR, NATIONAL CENTER FOR RESEARCH IN VOCATIONAL EDUCATION, UNIVERSITY OF CALIFORNIA, BERKELEY, CA; AND HARRIS N. MILLER, PRESIDENT, INFORMATION TECHNOLOGY ASSOCIATION OF AMERICA, ARLINGTON, VA

Mr. COLE. Thank you very much, Senator, and Senator Collins.

I might say first that on behalf of the AFT, I am pleased to present the testimony and would ask that the written statement be entered into the record, and rather than read the testimony, I would like to spend some time helping to put it into context.

Let me say that among my other hats, I am also vice chair of the National Skill Standards Board, and we would be happy to address any questions in more detail.

The CHAIRMAN. Thank you. I noticed some are squirming around out there. [Laughter.]

Mr. COLE. Yes. I think we are making quite a bit of progress, and I would be delighted to talk to you about that in further detail.

The CHAIRMAN. OK, fine.

Mr. COLE. I also served as a member of the SCANS Commission, which has been mentioned here, under the National School-to-Work Advisory Council, and as a former school teacher, I can assure you that some of our standards do end up being very successful, and in fact one of them is taking my picture right now.

As we all know, we are in the midst of an increasingly competitive global economy, and that competition is driving American employers to produce products and services that meet what ASTD has determined as new standards of quality, variety, customization, convenience, and timeliness. As a result, they are changing the very nature of work and the workplace, and these changes are re-

quiring very new and different skills from all workers, but particularly from frontline workers.

Historically, the mission of vocational education has been to prepare individuals for narrowly-defined jobs, albeit highly skilled, in many situations. Now workers are required to master new technology, to work on teams to solve problems, and increasingly, to exercise judgment over their work environment.

A number of studies have shown that as a result of these new demands in the workplace, we now require a much higher level of academic knowledge and skills—what I refer to as employability, or the SCANS skills—and of occupational knowledge and skills, and all of those not separately but in combination with one another.

This is true for incumbent workers, it is true for future workers, those in our schools, and it is also true for adults seeking to reenter the workforce, whether they are dislocated workers, displaced homemakers or others.

So that it seems to me and to the AFT that the challenge of our education and training system, and especially of vocational education, is much different now than it was a decade or two ago, and we would urge that the legislation reflect this new challenge.

A transformed vocational education system should be a high-quality, first-chance, school-based system that is an integral part of a broader, federally-led yet State and locally-implemented workforce development system. A number of States including my own, New York, have been working hard to put this system in place, and, by the way, I have also been pleased to work with former Governor John McKernan in Maine in developing what I think is a model system there.

The AFT believes that there are a number of principles that are the basis for the system and for the Perkins reauthorizations. Perkins should be reauthorized as a distinct first-chance, school-based education system.

I think there are essentially three legs to the stool if we are actually to look at what the elements of a system are. They are standards, assessments, and credentialing.

In terms of standards, we need rigorous academic employability and occupational standards, all of which need to be made explicit in the standards development and in the communication to educators. They should be the heart of the system, and there should be a link to the emerging work of the National Skill Standards Board of the academic standards effort, which I would be more than happy to talk about following my testimony.

We also need a coherent system of assessment that is tied to the standards and that will indicate to employers and to students and to their parents what students know and what they can do and how well they can do it. Vocational education students, as we heard earlier from Trish, should be held to the same rigorous academic standards as all other students.

The third leg of the stool is a system of credentialing. We need a system of nationally-recognized portable credentials that are envisioned by the National Skill Standards Board, and they should be encouraged, I think, in the legislation, the links to those. And also, we should encourage employers to make hiring decisions based upon those credentials so that there is an incentive for students to

want to achieve those credentials. Other countries do that much better than we do.

There also, then, need to be in place a number of things to support these three basic principles. The first is what I would call a collaborative partnership among employers and workers and their unions, educators, parents, and other key stakeholders. Employers and their workplace partners, workers and their unions, are the ones who must define the knowledge, skills and abilities of today's workplace, and they should work with teachers and others in integrating the academic and vocational education in the curriculum development, pedagogy and assessment.

Counseling as outlined in the testimony is also an essential ingredient if students are to have knowledge of the knowledge, skills and abilities of the new workplace as well. Professional development to assist school personnel and workplace mentors to develop new pedagogical strategies are necessary, and I would argue that there ought to be opportunity for workplace mentors and teachers to work together on professional development.

Also, links between secondary and postsecondary education should be fostered. We support the expansion of successful Tech-Prep programs as one way to achieve that. We also need a strong system of accountability, again as outlined in the testimony, to be in place so that Congress can be assured that its goals are met.

In terms of funding, we urge that specific responsibilities and activities for the Federal, State and local partners be clearly articulated in the legislation and that sufficient funds be there to support them. We do urge that the bulk of the funds go to the local level, based on a federally determined formula that gives priority to schools in most need—that is, districts with high concentrations of disadvantaged students.

And while we do not favor specific set-asides, we think it is absolutely essential to require States and localities to provide hard evidence that those historically served by set-asides are in fact being served.

In conclusion, let me say that the AFT applauds the Senate for your important reforms in the last reauthorization. We urge you to continue the leadership by enacting legislation that will continue the transformation of vocational education into a high-quality, first-chance system within a framework of workforce development.

Lily Tomlin in her role as "Chrissy" was quoted as having said that, "All my life, I have always wanted to be somebody, but I now see that I should have been more specific."

Well, we want all of our students to "be somebody," but we want a system that will also allow them to gain the skills so that they can have specific high paying jobs.

Thank you, Senator.

The CHAIRMAN. Thank you, Mr. Cole.

[The prepared statement of Mr. Cole follows:]

PREPARED STATEMENT OF PAUL F. COLE

Good morning Senator. I am Paul F. Cole, a Vice President of the American Federation of Teachers (AFT) and Chair of AFT Vocational Education Task Force. On behalf of the AFT, I am pleased to offer this testimony and ask that my written statement be entered into the record.

For over two decades, I have worked with employers, educators, workers, human resources specialists, and parent and community groups on education and training for work, and other workforce development policies. Under former Secretary of Labor, the Honorable Lynn Martin, I served on the Secretary's Commission for Acquiring Necessary Skills (SCANS). The SCANS commission conducted early work on identifying the skills necessary for success in new work environments. Currently, I serve as a Vice Chair of the National Skill Standards Board (NSSB), which is working to identify the skills required across a broad range of occupations and industries. I also serve on the National School to Work Advisory Council where I consult on the implementation of emerging school to work systems.

At the State level, I am pleased to serve on the New York State Design Team for Workforce Development under the able leadership of Commissioner of Education, Rick Mills and our State Department of Labor Commissioner, John E. Sweeney. The Design Team is developing a single, comprehensive, workforce development system. A key component of our emerging system is vocational education as the "first chance" education system that will route students to careers and postsecondary programs. The system will also have distinct components to upgrade the skills of incumbent workers and adults who are seeking employment.

I have been pleased to work with Maine's former Governor, Jack McKernan, as a member of the Maine International Board of Governors. The Board of Governors has helped in develop the Maine Career Advantage program. Through a combination of intensive classroom learning and structured workplace learning, Maine Career Advantage involves employers directly in the education process, including assessing students' performance, creating relevant curriculum, and developing occupational skill standards specific to their industry. The program provides a direct link to higher education through Maine's Technical College.

The AFT commends the Senate for its work on the last Perkins reauthorization. The Act has promoted innovations, such as provisions that require integrating academic and vocational education, and Tech Prep programs that articulate secondary school courses with postsecondary offerings. However, AFT believes that there is still much work to be done. For our students to meet new challenges in American workplaces and contribute fully as citizens in our democracy, it will require a continuing and significant transformation in how schools prepare students for initial jobs and careers.

The traditional role of vocational education was to prepare young people for narrowly defined occupations and their associated work procedures: less emphasis was placed on academic knowledge, skills, and abilities. This type of preparation was seen as adequate because many workplaces did not require of workers advanced academic skills, analytical and problem solving abilities, and knowledge of sophisticated and rapidly changing technologies. However, a revolution is occurring in our economy. Global competitiveness is driving American employers to produce products and services that meet higher standards of quality, variety, customization, convenience, and timeliness.

Many employers are changing how they structure work to meet these global demands and new workers must possess higher levels of academic achievement, employability skills, as well as general occupational knowledge. In fact, many new entry level jobs require some postsecondary education.

Studies indicate that parents, like employers, recognize the need for youth to obtain higher levels of academic skills, such as English, math and science. According to the Public Agenda Foundation's poll, entitled First Things First—What Americans Expect from the Public Schools, parents believe that schools must focus on higher academic standards and more advanced skills for the workers of tomorrow.

Therefore, a clear consensus is emerging among the primary customers of vocational education—employers, parents, and the general public—that the education of students who are headed for employment must focus on higher standards.

Federal legislation can play a key role in addressing employers' and the public's needs by advancing a "new" vocational education system which is well integrated with standards based education reform, and which is a part of a coordinated system of workforce preparation. By this the AFT means that vocational education has a distinct and critical role—to raise the achievement of youth in schools and prepare them for a variety of postsecondary education, training, and work opportunities. Secondly, vocational education officials and employer communities should have closer working relationships to develop programs that address workplace skill needs.

Accordingly, the AFT urges Congress to reauthorize vocational education as a distinct "first chance" education system, with a designated appropriation. The reauthorization should encourage State and local education officials to work collaboratively with employers to adopt clear academic, occupational and employability standards for student achievement. The legislation should encourage education offi-

risk to refocus and align their programs around these standards and develop strategies for helping students meet them.

A truly effective "first chance" system will reduce the need for the abundant "second chance" programs (i.e. remedial, drop-out, and short-term, narrow skills programs for adults who have not succeeded in schools) and use available resources more efficiently.

The AFT recommends the following principles as a guide for developing this new vocational education system in the current reauthorization.

Standards

Rigorous standards should be at the heart of the transformed vocational education system.

The vocational education reauthorization should encourage education officials to participate in academic and occupational standards-setting, including the work of the National Skill Standards Board (NSSB). The NSSB is establishing voluntary partnerships that will identify skill requirements across a wide range of economic sectors. Educators, community representatives, and representatives of parent organizations, along with representatives of employers, workers and unions, and workforce development specialists, should be encouraged to participate in these kinds of standards-setting partnerships.

Academic and Vocational Integration

Inasmuch as the new workplace requires individuals to have a solid grounding in academic knowledge, as well as a command of employability and occupational knowledge and skills, it is important that the integration of academic and vocational education be supported in the legislation. Done properly, this will reinforce the attainment of high academic standards as well as vocational competencies.

New legislation should help eliminate barriers to providing greater academic content in vocational courses and greater contextualized learning in academic courses. Greater emphasis on staff development for all school based staff and joint planning time for integrated curriculum development are needed. The legislation should encourage schools to move toward more intensive models of academic-vocational integration, characterized by multi-year, cross-curriculum and multiteacher collaborations. Also, the act should support work-based learning experiences for students that build on school-based learning. Funding for school-based coordinators and workplace mentors to coordinate school-based and work-based learning programs would help assure that students' learning experiences are meaningful.

Furthermore, the law should give local programs flexibility in designing approaches to improve the academic achievement of students. "Applied" or "contextualized" approaches, where students learn to apply academic knowledge in "real world" settings are promising. However, they will not be the most appropriate strategies for all students or in all learning situations.

Assessments and Credentials

Vocational education students should be held to the same rigorous academic standards as other students. To this end, the same State assessment systems should be used to measure the academic achievement of vocational and non-vocational students. This will help assure that the performance expectations and program improvement activities for all students are geared to high achievement.

The reauthorization should support the establishment of credentialing systems, based on rigorous standards and assessments. These should be developed with the involvement of, among others, representatives of educators, employers, workers and labor market analysts. Employers should be encouraged to use these systems for employment decisions. Employment decisions, based on assessments and credentialing systems that incorporate rigorous academic standards, and are consistent with civil rights laws, will give students incentives to take academic learning seriously.

Counseling

The current Perkins Act authorizes guidance and counseling activities that have never been funded. The reauthorization should support improved and expanded career development programs that span the elementary years to postsecondary education and training opportunities, and include appropriate funding levels.

Career development programs for K-12 youngsters should: 1) provide students with information about post-graduation academic training and work options; 2) make clear to students the knowledge, skills, secondary and postsecondary courses, certifications, and credentials required to take advantage of each option; 3) make sure that the courses and programs offered in high schools provide students with the necessary knowledge and skills to access each option; 4) offer coursework that will give students advanced standing in their post-learning experiences; and 5) support counselors to expand their contacts with businesses and postsecondary institu-

tions which will become the postsecondary destinations of students when they graduate.

Professional Development

The creation of a vocational education system based on rigorous standards and assessments and requiring new pedagogical strategies will not become a reality unless teachers and others charged with implementing the system are provided quality professional development. Professional development activities should focus on communicating academic, technical, and employability standards to school-based staff and training staff to assist students meet those standards.

Professional development activities should be a required use of funds, supported through: State leadership activities and local program improvement funds. Professional development should be planned with substantial involvement of teachers, teachers' aides, career counselors and other school staff. It should be school-based and allow academic and vocational teachers within the same schools to jointly plan, develop and, when appropriate, jointly implement curricula and instructional strategies.

Joint professional development activities should be permitted that involve school-based and postsecondary instructors, work site coordinators, and where appropriate, employers who are delivering educational services to students.

Postsecondary Education

Postsecondary education and formal training programs such as registered apprenticeships are appropriate extensions of the "tech-prep" system. The early success of Tech-Prep programs demonstrate the value of formal linkages between secondary and postsecondary institutions. Yet the system needs to incorporate rigorous standards, assessments and credentialing, and improved academic-vocational integration. In addition, articulation programs must promote greater collaboration between secondary and postsecondary staff to upgrade secondary curricula and pedagogy and to provide better counseling to students. Without increased attention to improving secondary programs, some Tech-Prep programs are focusing solely on moving the better high school students into postsecondary programs ("creaming"). The result is that there is no real improvement in the secondary school programs that have Tech-Prep agreements with these institutions.

AFT recommends that the new legislation expand funding for Tech-Prep programs that incorporate standards-based reform activities and focus on developing secondary-postsecondary linkages by improving secondary courses. Instead of a Tech-Prep set aside, States should be required to demonstrate in their plans and evaluations how they are using Federal funds to foster the expansion of quality Tech-Prep programs.

Local Funding

The AFT urges that the new law drive the bulk of Federal funds to local districts. These funds should be used to develop and improve vocational programs that integrate academic and vocational skills, meet the broad skill and knowledge requirements for occupations, support professional development for all school staff, and prepare students for both the world of work and postsecondary education and training.

Funding to local districts should be distributed based on a federally-determined formula that gives priority to schools in most need—those in communities with high concentrations of disadvantaged students. During the 104th Congress, the original Senate-passed version of S. 143 (the Workforce Development Act) included the current Perkins within-state formula, which is weighted for poverty and population, with a greater weighting factor for the population of students with disabilities. The AFT urges the Committee to maintain this within-state formula in its reauthorization.

State Funding

The AFT recommends that funding for state activities be designated for clearly defined leadership purposes, such as curriculum and assessment development, professional development for school-based employees, program coordination and technical assistance for local programs.

Federal Funding

Federal activity should focus on workforce system development, program improvement, and the promotion of State efforts to ensure access for all students to quality programs with high standards. The core of the system must be the development of voluntary national standards, the promotion of assessments and curriculum aligned with these standards, and a system of industry-recognized, portable credentials. It is clearly of national interest to define world-class standards and then encourage States to review and incorporate relevant standards as they develop curriculum frameworks and assessments.

The Federal Government can play an essential role in creating a national framework to assist (not direct) States as they reform their public education systems. To

this end, the Federal Government should encourage the establishment of a means to review State improvement plans and evaluations, facilitate assessment activities, provide technical assistance, and disseminate information on standards-setting ad best practices, including model integrated curricula.

Partnerships to Strengthen System and Program Development

State and local education agencies responsible for a transformed vocational education system should be supported to establish new collaborative working relationships with employers and workers. However, we urge you to avoid establishing business-education partnerships that are top-down, overly bureaucratic structures in which members of one group control the other group's work.

Research indicates that too often, when parochial business interests dominate the development of training programs and curricula, students receive training geared only to specific employers' needs. This preparation usually focuses only on narrow occupational skills. A transformed vocational education system must address a larger mission: it must develop programs that deliver advanced academic as well as broad occupational and employability skills.

We recommend that the legislation establish collaborative partnerships between educators and employers. The partnerships should clearly define the leadership roles for the partners, based on the expertise, experience and authority that each possesses. Employers and workers (Workplace Partners) should take the lead in defining and articulating the knowledge, skills, and abilities required of students to meet the academic, occupational, and employability (SCANS) standards necessary for successful work performance. These skills should be defined clearly and with the specificity necessary for educators to develop instructional programs.

State and local educators (Education Partners) should be supported to lead in developing, implementing, and administering programs that address these standards and skills. And they must have the authority to offer courses that lead to higher skills attainment if these courses will improve students' chances for career mobility.

Collaborative partnerships should be comprised of equal numbers of representatives of businesses, including workers, and representatives of education, including teachers.

There are other ways that schools and employers can work together.

In collaboration with schools, and their employees, employers can provide meaningful workplace learning opportunities for students--coordinated with school-based learning. Most schools are not equipped with modern workplace facilities and technologies. Workplace placements can give students exposure to the world of work and "real world" applications of academic skills, as well as mentoring and counseling experiences.

Employers can also collaborate with schools on professional development, so teachers will be more knowledgeable about emerging workplaces and technologies. State and local professional development funds should permit these kinds of training expenses.

Employers, especially those in small- and medium-sized businesses, require assistance in developing effective work-based learning programs: experiences explicitly structured to teach youth the real-world applications of what they learn in school, as well as technical and employability knowledge and skills. The legislation should encourage schools and employers to jointly develop these kinds of structured activities for youth.

Parent organizations should be encouraged to participate with educators and employers in standards-setting and planning activities. Provisions that require outreach to involve parents in vocational education partnerships should be included in the legislation.

Accountability

Implementation of a new system for vocational education will require careful monitoring, and ultimately, accountability for results. However, change of the magnitude that is necessary takes time. Those responsible for implementing the new system must be encouraged to be creative, experiment and explore new approaches and build on successful ones. Accountability measures, in the form of sanctions that are too quickly imposed, can thwart, rather than encourage innovation and improvement. Accordingly, accountability measures must be balanced, appropriate and imposed when reasonable supports for program change are in place. These supports include wide dissemination of legislative intent (e.g. via rulemaking), technical assistance on standards-setting, assessment and credentialing methods, and assistance to improve curricula, instructional methods, and counseling approaches.

When critical supports are in place, the evaluation of the Federal investment can begin to show results. Educational outcomes should be a primary focus of evaluations, as well as job placement indicators.

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If program supports are in place and student achievement does not improve, each program that fails to show progress should be required to develop and implement a State-approved program improvement plan, which may be in effect for up to 2 years.

Set Asides

Federal legislation should eliminate set-asides at State and local levels. For instance, funding formulas for special populations are harmful when they provide an incentive for schools to retain students in these categories because funding depends on it. The 1990 Perkins Act was correct in replacing categorical, set-aside funding with general funding formulas weighted to reflect the presence of special populations. The act still demands that funds be spent on special populations.The new legislation, however, should require States to provide evidence through their plans and evaluations, that special populations have access to quality programs.

The placement of a student should be determined by individual assessments that determine the most suitable programs and the accommodations required to participate in the program.

Conclusion

The Perkins Act has produced significant improvements in the way vocational programs serve the academic ad technical skill needs of students. Local integration and articulation efforts should continue to be supported in the new legislation. However, academic/vocational integration and articulation activities must be an integral part of the movement for high academic, occupational, and employability standards and a key component of a coordinated workforce development strategy. Clear and rigorous standards are essential to a new vocational education system. Without them, we will not graduate students who possess the requisite kinds, or levels of skills necessary to successfully perform workplace tasks or master postsecondary courses.

This completes my statement, Senators. I would be pleased to respond to any questions you may have.

The CHAIRMAN. Mr. Stern.

Mr. STERN. Thank you, Senator, Senator Collins. It is an honor for me to be here, and I thank you for inviting me to speak to you about this report on "School-to-Work Policy Insights from Recent International Developments."

I will reveal that I am also from Massachusetts, but I will speak about events beyond New England.

In the title, "School-to-Work" is meant to refer to a whole movement that includes the Federal initiatives as well as a host of State and local initiatives, some of which we have described as "new American high schools," and in addition to the summary of my report and the full text of the report which are both available to you, I would like to enter into the record this booklet entitled "New American High Schools," which describes some of the schools that Trish McNeil was referring to.

The CHAIRMAN. Without objection, it will be made a part of the record. Nobody objected.

Mr. STERN. Thank you.

In the report that I was asked to summarize briefly, we describe developments in other industrialized countries, and I had the rare opportunity to serve as a staff member at the OECD for 2 years, in 1993 and 1994, where I was enormously impressed by the similarities in the discussions in all the industrialized countries. Of course, there are immense differences in history and institutions among the countries, but despite those differences, we found four main themes that are appearing in current policy discussions and developments and practices in most of the OECD industrialized countries.

One is an effort to somehow combine more closely than before the academic and vocational. There have been many comments about that here today. Let me just mention that even Hermann

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Schmidt, who is president of the Federal Institute for Vocational Training in Germany, which oversees the famous German "dual system," has written that the traditional separation between academic and vocational training is becoming obsolete.

I will not go into the reasons because I think you have explained them, and they are well-understood, but let me mention examples. In England, for instance, there has now been since 1991 the development of what are called "general national vocational qualifications," or GNVQs, which are based on broad industries like hospitality and tourism, manufacturing, and so on. Students take a sequence of related courses which result in both an occupational qualification and, for those who go to the third level, a qualification that allows them to enter university, and of those who have applied to university, more than 90 percent have been successful in gaining admission.

So the English have now worked out a system that really combines the academic and vocational. Japan likewise is experimenting with a so called integrated course in their high schools which similarly allows students to prepare both for college and careers. Norway; Germany, it is worth nothing that in I think it was 1993, 30 percent of German university students had completed apprenticeships in the dual system before entering university, and it is a matter of policy in Germany to make this transition easier for students. In the United States, of course, we see that students who go through some of the vocationally-oriented or new school-to-work kinds of programs are getting excited about academics, and in a sense, these programs are an alternative way to upgrade academic skills.

There is a paper by my colleague Tom Bailey which our Center published on "School-to-Work for the College Bound," which I can leave a copy of for you.

The CHAIRMAN. I will make that part of the record also; I think that that is an important piece of information.

Mr. STERN. I am very happy to do that.

The second point of convergence that we see in many countries is an attempt to link academic and occupational skill standards. We have spoke, and I guess we will speak more, about the development of the occupational standards.

Other countries have, I would say, in most cases better-developed sets of national occupational standards, but even there, the issue is how do they relate to the academic standards. If the aim is for students to be able to go through an occupationally-oriented program and still have the option to continue in further schooling, there has got to be some direct crosswalk, some direct connection between these two sets of standards. I think that that is also an issue we must face in this country. England, Denmark, other countries have moved in this direction recently.

The third point is work-based learning being made available for all students. Of course, in Germany, the dual system is founded on work-based learning, but we see an increase in apprenticeship kinds of programs in many countries or, in school-based systems like France, we see an attempt to get more students out into the workplace as part of their schooling, similarly in the UK and Australia.

The final point is greater collaboration between educators and employers. Again, this has been a hallmark of the system in German-speaking countries. In Japan also, employers have taken a major role in actual training, and they have close connections with schools for recruiting students, but now, England, France, the Netherlands and other countries have also been moving to try to strengthen these kinds of partnerships.

So the conclusion, very briefly, is that there is clearly a worldwide trend in industrialized countries, all responding to the same perceptions that we are responding to and that local communities around this country are responding to, that the new economy requires a new kind of preparation to prepare for college and careers and lifelong learning.

The CHAIRMAN. Thank you, Mr. Stern.

[The prepared statement of Mr. Stern follows:]

JOINT PREPARED STATEMENT OF DAVID STERN, THOMAS R. BAILEY, AND DONNA MERRITT

SCHOOL-TO-WORK POLICY INSIGHTS FROM

RECENT INTERNATIONAL DEVELOPMENTS

In countries where young people have been relatively successful in both achieving high academic standards and making smooth transitions to employment—notably, Japan and Germany—employers have taken major responsibility for their training. German employers play a lead role in the famous "dual system." Japanese employers provide extensive training to recent school graduates after hiring them. Policy makers in other countries have therefore been attempting to emulate this success by increasing employer involvement in the training of young people.

Now the emergence of a more "learning-intensive" economy poses new challenges, both for countries with hitherto successful systems and for others. Employment is becoming increasingly fluid, occupational boundaries are changing or dissolving, and more jobs are temporary. Continual learning is a more important part of work, both because some organizations are giving more responsibility to front line staff for solving problems and improving procedures, and because more people are obliged to move from one employer to another. Organizations are seeking to promote learning and at the same time contain the cost of training through "on-line learning" strategies such as cross training within work teams, job rotation, and skill-based pay.

Traditional forms of education do not provide the best preparation for this emerging economy. Vocational education has tended to become too focused on specific skills and occupations that are likely to change in the future. Traditional academic education by itself is also inadequate, because it does not equip students to apply their abstract knowledge or to learn in the context of practical problem solving. In response to the perceived insufficiency of traditional education and training to prepare young people for more learning-intensive work, recent policies in many industrialized countries are converging on four principles:

- New curricula should be created that integrate academic and vocational studies[1].
- Occupational and educational performance standards should be explicitly related to each other.
- To prepare for learning-intensive work, initial education and training should include a certain amount of work-based learning for all students.
- Employers and educators, including both academic and vocational educators, must share both responsibility and power in new school-to-work systems.

The first principle is the most fundamental from the perspective of U.S. policy, because it affects how the others are implemented. Work-based learning, performance standards, and school business partnerships often occur in countries that

[1] In this paper, "academic" refers to a program of study that is primarily intended to prepare students for higher levels of formal education, and "vocational" refers to a program of study that is mainly intended to prepare students for work. Ordinarily, traditional academic courses are more abstract and theoretical, while traditional vocational courses are more concrete and applied. However, as will be noted, some traditional vocational programs in fact may include more theoretical and abstract subject matter than some academic programs.

maintain strict separation between occupational training and academic education. These practices, by themselves, will not achieve the integration of academic and vocational education that is now being recognized as desirable in most countries.

To prepare individuals for work that demands autonomy and continual learning, many employers now call for education that promotes high-level thinking skills for all students, not just for the elite as in the past. Vocational education, which in many countries traditionally has offered practical training for students who were considered to possess relatively low academic ability, is now being reformed and in some places radically reconstituted. Reforms include strengthening the academic content of vocational preparation, as in the program of study for the French vocational secondary diploma instituted in 1986. In Germany, where many apprentices have traditionally received a high level of theoretical instruction as part of their training, there have been efforts in recent years to bolster the academic content even more. Countries are also making it easier for vocational graduates to pursue further studies at the university level, as in Germany where 30 percent of university students in 1994 had completed apprenticeships in the dual system. These changes are intended to attract larger numbers of intellectually talented students into vocational programs, to give them sufficient theoretical grounding to deal with changing technology, and to prepare them for continual problem solving.

As change proceeds in this direction, the line between vocational and academic education becomes less distinct. Instead of serving as an alternative to general education, vocational education becomes a method for promoting it. For example, in 1991 Britain began developing "General National Vocational Qualifications" which enable students to qualify for the university through courses of study that focus on broadly defined industries. In 1994, Japan started offering a new "integrated course" that permits high school students to design individual study sequences preparing them for both careers and higher education. These initiatives to start blending vocational and academic education mirror the increased merging of production and learning in the workplace.

Formal standards and certification procedures, which specify what individuals should know and be able to do, are important elements of a school-to-work system. Many countries are now re-examining their standards or establishing new ones. Countries with well-established occupational training systems have been reducing the numbers of specific occupations to promote workers' flexibility, and including more generic work skills. But occupational and academic standards have usually been defined separately. These changes in occupational criteria can be carried out without bridging the separation between academic and vocational streams. For example, in Germany, where approximately two-thirds of the youth population participates in apprenticeships, the reform of vocational standards affects most young people but does not entail changes in the academic curriculum of upper secondary schools (Gymnasien) geared to university preparation.

Other countries are trying to develop vocational credentials that can serve as a step to university and other forms of higher education. England and Scotland have made some progress in this regard. The Netherlands and Denmark have developed vocational routes to higher education. Growing numbers of young Germans who graduate from academic high schools are completing apprenticeships before going on to universities, and the theoretical preparation of German apprentices is becoming even more rigorous. Countries that are following this path sometimes invoke the goal of achieving "parity of esteem" between vocational and academic education. No country has yet developed a unified secondary school structure based on one set of credentials for both vocational and academic studies, but current reform plans in Scotland call for an integration of many previously separate vocational and academic programs while still maintaining separate vocational credentials for many students. The state of Victoria in Australia has achieved a relatively complete integration of the formerly separate vocational and academic secondary school systems, including new curriculum and assessment methods.

Because one hallmark of the emerging economy is the necessity for continual learning in the context of work, a logical implication for initial education and training is that schools should give young people some experience in work-based learning. By gaining practice in the deliberate use of work to develop knowledge and skill, young people should be better prepared for a lifetime of on-line learning at work. There is some evidence from France that this is so. Two basic strategies for work-based learning are classic apprenticeship and school-supervised work experience. In a classic apprenticeship, trainees have some of the rights and benefits of regular employees as well as some special entitlements. The German dual system is the biggest example of this kind. Several countries including Britain, the Netherlands, and Spain have recently created new apprenticeship systems or expanded existing ones. The same countries, and others including France, Korea, and Sweden

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have also taken major new initiatives to expand work-based learning for students who are still under school supervision.

While some students in lower-secondary or middle school participate in school-supervised work experience that is broad-based and exploratory, most of the newly created work-based learning is for upper-secondary students and is still tied to vocational education with no connection to academic subjects. Unlike some incipient efforts in the United States, most of the new initiatives in other countries do not attempt to combine work-based learning with an integrated curriculum designed both to prepare young people for work and to maintain their option of enrolling in a university or other selective institution of higher education.

One form of school-supervised work experience is school-based enterprise, which engages students in production of goods or services for other people as part of a class or related school activity. Denmark recently has expanded the use of school-based enterprise in vocational education, to supplement the number of training places available in outside firms. Some German apprentices spend a portion of their time in school-based enterprises within enterprise-based schools. Like other forms of school-supervised work experience, school-based enterprises both in other countries and in the United States have mainly been part of vocational education, although a British initiative in the 1980s promoted mini-enterprises within the general academic curriculum, and Norway has recently been promoting a general form of entrepreneurship throughout primary and secondary education.

Development of work-based learning and links between occupational and academic skill standards call for **increased sharing of power and responsibility between educators and employers.** In countries where schools still carry the main responsibility for education and training, the role of employers has increased. For example, in recent years employers have taken a more active part in the governance of work-related education and training in Australia, Britain, and France. Both in these countries and in Germany, where employers traditionally have had a major say, the employers' participation in governance has been limited to vocational education, however. Employers still do not participate directly in determining the curriculum of secondary school programs whose primary mission is to prepare students for selective institutions of higher education.

This report concludes that industrialized countries in Europe, Asia, and Australia are pursuing reforms similar to those under way in many American communities: overcoming traditional distinctions between academic and vocational curricula, and combining the two with work-based learning in an integrated course of study that prepares students both for careers and for college or university. Since every country has its own unique set of institutions, the reforms take a different shape in each context. Some countries are just beginning to move in this direction; others are continuing a process begun decades ago. In spite of the differences, the fact that most industrialized countries have now decided to undertake similar changes suggests that the reasons for them are strong and pervasive.

[Due to the cost of printing, the booklets submitted by Mr. Stern entitled "School-to-Work Policy Insights from Recent International Developments," "New American High Schools," and "School-to-Work for the College Bound" are retained in the files of the committee.]

The CHAIRMAN. Mr. Miller.

Mr. MILLER. Thank you, Senator Jeffords, Senator Collins. I apologize that I am not from New England, but I worked for a New England Senator, my wife is from Massachusetts and went to summer camp in Maine, so at least some of it is covered.

I am Harris Miller, president of the Information Technology Association of America. We have 11,000 direct and company members throughout the United States involved in all aspects of the information technology marketplace, including custom and product software, the Internet, outsourcing, electronic commerce, systems integration, and telecommunications.

We are also involved with 26 regional associations throughout the United States. I also serve as president of the World Information Technology and Services Alliance, which consists of 25 associations like ours throughout the world. And in June 1998, we will host the 11th World Congress of Information Technology, quite fittingly at George Mason University in Fairfax County, VA.

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Two months ago, Mr. Chairman, we produced the report, "Help Wanted," which you referred to, which explains in graphic detail the challenge that the information technology industry faces right now, and I am very pleased that two members of your committee, Senator Warner and Senator Murray, joined me at the press conference when we released this report, indicating their commitment, and I know your commitment, to solving this IT worker shortage.

I would first like to discuss the major findings of the report and then give you some ideas of the thoughts from the employer community perspective on how the vocational act could be involved in helping to solve the problem.

I talk about a "crisis" in information technology, a word which I use reluctantly because from all outward appearances, the information technology industry is going through an unprecedented period of growth. In the 51 years since the computer was first unveiled, never has the industry had such a major impact on so many aspects of society—education, health care, law enforcement, Government, utilities, the media, and so on. Virtually every aspect of our lives is impacted directly by IT.

The Internet has been described as the largest communications breakthrough since Gutenberg first produced his Bible, yet most agree it is still in its infancy. The opportunities for its growth are mind-boggling, with an estimated 30 million-plus users, expected to grow to over one billion in just 5 years. A recent report issued by the Global Internet Project, which is affiliated with my association, indicates that last year alone, 1.1 million jobs were created by the Internet.

Yet at the same time we have this very positive news, Mr. Chairman, a major challenge has been lurking just beneath the surface which has now exploded into view—the dramatic shortage of skilled workers in the information technology industry. The "Help Wanted" study documents systematically for the first time the breadth and depth of the challenge we face in the United States, and I note that following Mr. Stern's comments, other countries like the United Kingdom and Canada are facing similar IT worker shortages. I have with me a report from the UK entitled, "The End is Nigh: 1996 IT Skills Trend Report," indicating a similar crisis in the UK.

Moving beyond the anecdotes we have read for several years, our study demonstrates conclusively that there are at least 190,000 vacancies in our country today for IT workers, and the number could grow rapidly. It also shows the shortages are nationwide and exist in both IT companies and in nonIT companies which employ IT workers. In other words, it is not just software and service companies which are facing shortages, it is banks, manufacturing firms, governments and all other aspects of our economy which use IT workers. We are all facing the same problem.

How important is this IT worker shortage for our industry but, more importantly, for the U.S. economy? Well, think about running out of iron ore in the middle of the second Industrial Revolution and the impact on the world that would have had had it occurred. In the knowledge revolution, skilled people are the rocket fuel for continued growth and expansion just as iron ore was essential for the Industrial Revolution. So this problem is not just an industry

problem, Mr. Chairman; it fundamentally impacts the U.S. and all global economies.

Let me summarize the major findings of our study, which was conducted in late 1996. As I mentioned, the number of vacancies is currently 190,000. I emphasize that this is a conservative estimate because we did not include in our survey small businesses, government or nonprofit employers; we just surveyed medium and large-size companies.

In terms of percentages, this translates into approximately one vacancy in every 10 IT jobs—one vacancy for every 10 IT jobs right now.

A third finding is that 82 percent of companies surveyed said they expect to increase the number of IT workers they need, even though they currently face shortages.

Seventy-one percent of companies believe that the IT worker shortage is more difficult to deal with than other shortages in other skill areas.

Sixty-eight percent of IT companies say that they see this shortage of workers as the most substantial barrier they have to continued growth.

And, last but not least, and very relevant to today's hearing, education must be a key aspect of any solution.

Wherever I travel throughout the country and throughout the world, the IT worker shortage is the number one topic. It is just as salient for retailers, for manufacturers, for financial institutions and for Government officials as it is for people in my own industry.

But it is not enough for the IT industry just to have identified this problem systematically. We must also offer solutions, and that is the second part of the agenda which I want to discuss with you today.

When we released the study in February, I outlined an action plan to help bring national attention to the skills shortage issue and to help build a broad-based alliance for achieving creative solutions. I have had a chance since the report was released to brief leaders in Government, industry and academia and have broad-based support. Let me just outline those briefly.

No. 1, we believe there is a need to hold a national convocation bringing together all aspects of the stakeholder community—Government, the education community and industry—to try to come up with solutions. The University of California at Berkeley has tentatively agreed to host such a convocation in January of 1998, and we are beginning to organize a task force which will go into putting together that convocation. It must avoid the finger-pointing and traditional ideological battles which we have too often seen and come up with specific, achievable goals to solve this crisis.

Second, we believe we need to establish a national commission on the IT worker shortage. We have been working with Senator John Warner on introducing such legislation. This will bring high-level attention to this issue that only high-level Government people can bring. We believe that focused hearings around the country would be very important, and I would note that Canada, our neighbor to the North, established a Software Human Resources Council in 1991, which has helped to deal with their similar shortage.

And third, we think it is critically important to establish a new paradigm for the relationship between the education and IT communities. Let me briefly use a sports analogy to illustrate the point.

Up until now, the IT industry has behaved a lot like the National Football League. We have depended on the colleges and universities to produce our athletes for us, and only after they graduate *do we really get involved in giving them specific skills to work in* industry.

It has worked pretty well; we do have the leading industry in the world. But the question is, as the industry has grown as large as it has—it is now more than 2 million workers—does that paradigm still work?

I would like to suggest that it does not work anymore and that in fact we have to look to another sports metaphor, which is the way the baseball teams develop their talent. In fact, major league baseball is very heavily invested in their minor league systems and without a strong minor league system would not be able to produce the talent that goes onto their fields every night and produces such a saleable commodity and such excellent athletes.

To use that analogy means the industry has got to become much more directly involved in making sure that we are turning out enough athletes—or in this case, enough works—for our industry. We have to work much more carefully and closely with the education community, not simply standing back and waiting for them to produce results, but being involved.

From my frequent discussions with IT company executives, I know that many entry-level positions with high-tech firms can be filled by bright, motivated people who may not possess a 4-year college degree. Some of my member companies, for example, offer "boot camp" programs in COBOL and other computer languages, training noncomputer programmers to become computer programmers in a very short period of time. Other companies fill well-paying jobs with titles such as network installation specialist, customer support representative, junior telecommunications analyst, with nondegreed individuals.

I do not mean to suggest that people should not get a 4-year degree if that is where their initiative takes them, but we can look to a broader and more clearly delineated glide path that may involve much more vocational training.

So as this legislation comes up for reauthorization, Mr. Chairman, I would suggest you keep the following factors in mind: number one—this has been discussed by all the witnesses today—the national and global economic shift from industrial to information-driven creation; number two, the critical need to take bold steps now to address the talent gap; and number three, the logic of reengineering vocational education to accommodate changes in the marketplace.

In short, I call upon you and your committee colleagues to seize the day, helping America realize its opportunities by matching enormous potential with the clear need we have demonstrated.

Thank you very much.

[The prepared statement of Mr. Miller follows:]

PREPARED STATEMENT OF HARRIS N. MILLER

Good morning Chairman Jeffords and other distinguished members of the committee. I am Harris Miller, President of the Information Technology Association of America (ITAA). ITAA, now celebrating its 36th year, has 11,000 direct and affiliate member companies throughout the United States. Our members are marketplace leaders in product and custom software, the Internet, outsourcing, electronic commerce, systems integration, and telecommunications. We are involved with 28 regional information technology associations around the country. I also serve as President of the World Information Technology and Services Alliance (WITSA), comprised of 25 member associations throughout the world. In June, 1998, ITAA will host the 5th World Congress on Information Technology.

Two months ago, ITAA proudly published a seminal report, "Help Wanted: The Information Technology Workforce Gap at the Dawn of a New Century." I am very pleased that both Senator John Warner and Senator Patty Murray joined me and my member companies at the press conference releasing the report, indicating their commitment to helping solve the worker shortage problem.

The report documents a crisis faced by the information technology (IT) industry and shared by all industries which leverage information technology to gain competitive advantage. Today I would like to discuss the report's major findings and spell out a course of action that ITAA believes will put the Nation on the path to corrective action. In this latter half of the discussion, I will offer a vision for the role of vocational education in expanding the pool of skilled professionals and filling the talent gap.

Make no mistake. I use the word "crisis" reluctantly to describe the worker shortage. The IT companies I represent are going through an unprecedented period of growth. In the 51 years since the first computer was unveiled, never has the industry had such a major impact on so many aspects of society—education, health care, law enforcement, financial services, telecommunications, transportation, government, utilities, the media. Virtually every aspect of our lives—both here and abroad—is impacted directly and in most cases positively by IT. The Internet has been described by many as the largest communications breakthrough such Gutenberg produced his Bible, yet most agree it is still in its infancy. The opportunities for its growth are mind-boggling, with its estimated 301 million users expected to grow to over 1 billion users in just 5 years. A recent report by the Global Internet Project (GIP), which is affiliated with ITAA, indicates 1.1 million Internet related jobs were created last year alone.

Yet at the same time we have this positive news, a major challenge has been lurking beneath the surface which has now exploded into view: the dramatic shortage of skilled workers in the information technology economy. The "Help Wanted" study documents systematically for the first time the breadth and depth of the challenge we face in the United States. I note that other countries such as the United Kingdom and Canada are facing similar IT worker shortages.

Moving beyond the anecdotes we have read for several years, "Help Wanted" demonstrates conclusively that there are at least 190,000 vacancies in our country for IT workers today, and the number could grow rapidly. It also shows the shortages are nationwide, and exist in both IT and non-IT companies which employ IT workers. In other words, it is not just software and service companies which are facing shortages. Banks, manufacturing firms, governments, and all others which use IT are also having a hard time filling their labor needs.

How important is this shortage for the IT industry and for the U.S. economy generally? Think about running out of iron ore in the midst of the second industrial revolution, and the impact on the world that would have had. In the knowledge revolution, skilled people are the rocket fuel for continued growth and expansion, just as iron ore was essential for the industrial revolution. This problem is not merely an industry problem. It fundamentally impacts the U.S. and global economies. Just to give you one example, the Potomac Knowledgeway, a Washington, DC area organization which promotes growth of the IT industry in the Washington metropolitan area, hopes to create over the next 5 years 50,000 new IT industry jobs in this area, which will generate over $3.5 billion in additional consumer spending. But those jobs will be meaningful only if there are workers to fill them. And Northern Virginia alone has an estimated 18,000 current IT openings.

Let me summarize the major findings of our study, which was conducted in November and December, 1997:

- The number of unfilled positions for IT employees at large and mid-size U.S. companies is 190,000. This is a conservative estimate, because we did not include in our survey small businesses, government, or non-profit employers.
- This translates into approximately one vacancy in every ten jobs.

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- Eighty-two percent of these companies expect to increase the number of IT workers they employ, with only two percent expecting a decrease in their IT employee.
- Seventy-one percent of companies believe the demands for IT workers is higher than for other skilled workers.
- Sixty-eight percent of IT companies, a substantial majority, see the shortage of skilled IT workers as a barrier to their growth.
- Increased recruiting and training are only a partial solution to the problem.
- Education will be a key facet of any solution. The challenge is enormous, however, as indicated by one example: from 1986 to 1994, the number of bachelor degrees in computer science annually awarded dropped 43 percent from 42,195 to 24,000.

This IT worker shortage is not a potential problem. It is an actual problem today. Wherever I go in my extensive travels, my members and others who depend on IT workers tell me the same thing: they are facing extreme difficulties finding adequate labor. Whether it be in Silicon Valley, Route 128 around Boston, Research Triangle in North Carolina, or the Washington metropolitan area, the number one topic for the IT industry is skilled workers. But the need is just as salient for major retailers, research labs, and financial institutions. The chief information officer of a major financial institution told me recently the IT worker shortage is his current major headache, and a senior government official recently indicated the same.

It is always my belief that it is not enough to identify a problem. One must also offer solutions. And that is the second part of ITAA's agenda. That is why I am so pleased to participate in this hearing.

I would not be so presumptuous as to claim that ITAA, as effective as it is, can have all the answers to the IT worker shortage. The challenge is so fundamental that it will take a united effort of government—at all levels—the education community—at all levels—and industry to find both short and long term solutions. ITAA is committed to being a catalyst, energizing the appropriate entities to focus sufficient attention and resources on this issue to produce results.

When we released the "Help Wanted" study in February, I offered an action plan aimed at bringing national attention to the skills shortage issue and forging a broad based alliance for achieving creative solutions. In the months which have followed, I have briefed the plan to leaders in government, industry and academia and have garnered strong support. Allow me to summarize this program:

1. ITAA will work with the Administration, Congress, the Governors and State Legislatures, the education community at all levels, the IT industry, and other elements of the private sector which employ IT workers to create a National Convocation on the IT worker crisis, bringing together individuals from all the impacted sectors to focus on the problem and possible solutions. Leaders from Federal, State, and local Governments, from the education community, and from industry must join together at the highest levels. Prior to the Convocation, task forces will meet to develop workable plans and share best practices. This Convocation will avoid finger pointing and traditional ideological battles, and focus on specific, achievable goals.

2. We need to establish a National Commission on the IT Worker Shortage to carry through on the need to have a focus on the issue. No magical, immediate solution exists. To deal with this crisis requires a sustained level of effort and attention which a high-level Commission will bring. The Commission should be composed of leaders from government at all levels, the IT industry, and the educational community, focusing on novel approaches to solving the problem and measures of success. Canada, realizing its own IT worker shortage, established the Software Human Resources Council several years ago which has contributed to growing the Canadian IT workforce.

3. The education paradigm for the knowledge age needs to be reexamined both by the education community—the vendors—and the IT industry—the customers.

Let me use a sports analogy to illustrate the point. Up until now, the computer industry has been like the National Football League (NFL), depending on our Nation's colleges and universities to produce sufficient talent necessary to play at the national level. Just as for the NFL, our university system has performed brilliantly, fielding the talent that has driven the U.S. IT industry to world leadership.

But the question is, is this paradigm still correct when the demand for knowledge workers has become so great? When the computer world consisted of a few thousand, then tens of thousands, and then even hundred of thousands of workers, enough graduates were generated from our colleges and universities to feed the demand. But the size of the industry has grown dramatically and continues to grow. Even if the number of computer graduates had not declined so precipitously over the past decade, we would still face a shortage.

[illegible] of the traditional college to MFL model, perhaps the professional baseball system of multi-level farm teams holds the key. In that system, while local individuals usually own the teams, major league baseball teams invest in them by providing financial and training support. It used to be a truism of baseball—at least before free agency—that the major league teams with the best farm systems won the most pennants.

The marketplace is telling us it is time to examine new paradigms, including a more involved role for the IT industry itself in our education system, and major shifts in our Nation's approach to education, to meet the demands of the 21st century.

How do we create this baseball-style farm system for the information technology industry? The reauthorization of the Perkins Vocational Education Act can be a positive force. ITAA sees a clear and important role for vocational education, school-to-work, community college and adult education programs as the talent incubators for the information technology industry. From my frequent discussions with IT company executives, I know that many entry-level positions with high tech firms can be filled by bright, motivated people who may not possess a 4-year college degree. Some of my member companies offer "boot camp" programs in COBOL and other computer languages, training non-computer programmers to become computer programmers in a very short period of time. Other companies fill well-paying jobs with folks such as network installation specialist, customer support representative, junior telecommunications analysts, systems operators, and peripheral operators with non-degreed individuals.

I do not mean to suggest that people should not try to earn a 4-year degree or even graduate degree if that is where their knowledge and initiative take them. As government, industry and academia work together on the IT worker issue, however, we can do more to create a broader and more clearly delineated "glide path." ITAA stands ready to work with the Committee, industry groups and others in building this path to the future.

Thus, as this legislation comes up for reauthorization, I suggest the Committee approach it with the following factors in mind:

- the national and global economic shift from industrial to information-driven value creation;
- the critical need to take bold steps now to address the talent gap in the information technology industry;
- the logic of re-engineering vocational education to accommodate changes in the marketplace.

In short, I call upon you to seize the day—helping America realize its opportunities by matching enormous potential with clear need.

I first proposed that the National Commission on the IT Worker Shortage and the National Convocation working with Congress and the Administration can develop a winning mix of internships, continuing education, apprenticeships and similar initiatives—a model program to provide the leadership absolutely essential to addressing this critical issue.

I want to be very candid here about our view of educational improvement. We are supportive of the efforts of President Clinton, the Congress, and various States and localities to improve our Nation's educational system generally. As the father of two children in our public school system, I am very aware of its strengths and shortcomings and the need to improve our efforts across the board. Certainly, improving the schools generally will benefit the IT industry generally.

ITAA is also very supportive of efforts to increase IT in the classrooms. The dramatic improvements in performance for students who have access to IT is undeniable.

But what we are calling for today is a much more focused effort, centering on the need for IT workers. Wiring a school is great. But if all its graduates become lawyers, doctors, and accountants, the IT workforce shortage is not being addressed. Improving test scores is wonderful, but not if graduates are all liberal arts majors.

We are understandably reluctant to see country and especially in the IT industry to talk about trying to guide the economy of any segment of it. Basic economics tells us equilibrium should work over time to bring more knowledge workers into the economy and end the shortage. We cannot force people into our industry.

But, again, think of the consequences of not taking action. Our basic commodity for the IT industry—skilled people—is not there. While our number of computer science graduates has declined since the mid-1980's, countries such as India, through a focused effort, have produced hundreds of thousands of new knowledge workers, giving them a formidable international presence in the computer world.

Not dealing directly with the IT worker shortage threatens not only the growth of the IT industry, but the growth of the entire U.S. economy and our global com-

government. It threatens the wage mobility which is the bedrock of this country's low inflation.

In short, the stakes are high.

Therefore, ITAA stands ready to look outside the envelope—including to the vocational educational world—for solutions, both short and long term. We are confident others will be willing to do the same.

The CHAIRMAN. I thank all three of you for very excellent statements.

Mr. Miller, I appreciate the work that you have done, Mr. Stern, and Mr. Cole, and I want to work with all of you on trying to help our country take advantage of your knowledge as far as the direction in which we need to go.

Mr. Miller, your report illustrates that we need to take drastic action at all levels of restructuring our educational system. I am currently working, as I mentioned earlier, on doing that for this labor market area. I have spoken with Senator Warner and others, and hopefully, we will be able to do something. So I would appreciate being able to work with you, and I will show you the legislation and what we intend to do, because I was surprised to find that this labor market is very highly technology-intensive and, as I mentioned earlier, there are thousands of jobs going begging. So I appreciate that.

Mr. Cole, I want to see us take the District of Columbia from its present dismal position and make it the best in the country, and I very much appreciate the efforts of the AFT and know they are dedicated to doing that. In addition, I do not know who represents the other surrounding counties, do you have representation there?

Mr. COLE. We have some members in all of them, but I would say that we have an excellent working relationship now with the NEA and would be happy to assist in any cooperative efforts.

The CHAIRMAN. Good. I am going to call upon both of you to also help with this labor market restructuring and the education and human resources to do that.

Mr. Stern, I was impressed with your in-depth report about what is going on in the other countries of the world and I have Hedrick Smith's very fine book in that area, which I imagine you have read also. The question now is how do we use this information. What is replicable, and how do we make people more aware? I am a little disappointed in the turnout today of my own committee for what I consider to be one of the most important subjects before us, and I will take that up with them, but I just want to know how I can utilize your information and how we can make it more generally known to not only our members but, more importantly, to the educational community.

We have got to get an understanding from everyone that, one, we have a problem, and two, we do not have that much time left to fiddle around. We have been fiddling around for 14 years now, and it is time we learned from the successes of others. So I would appreciate any comments you have on how we can try to get our people motivated to look at what others are doing and the dangers we will face if we do not learn from them.

Mr. STERN. I would just comment, Senator, that I have been a little dismayed by the fact that we in this country pay so little attention to what is going on elsewhere, and in that respect, I think we are unique in that in other countries, it is almost a matter of

course to consider what is best practice. The Australians, the Danes, the Japanese are always looking around to find best practice elsewhere, and I think it is just not one of our habits, at least not in education, as much as it is in other countries.

This small report is perhaps one gesture toward trying to make information from other countries available, but I think we need more opportunity to learn from that, and perhaps that ought to be part of the charge if there is some research component in new legislation, to make sure that there is an opportunity to learn from abroad.

The CHAIRMAN. I know I have had some interest by members of the committee to go around and take a look at it. There are some exciting places to visit, so maybe we can get more interested than are attending the hearing today. So I would like to work with you.

Senator Kennedy and I were saying earlier that we ought to get our members out to look at some of these, so I am going to try to participate in such an adventure. I think Asia is probably a good place to look at sometime, too, but that would be a little harder to put together. So I would appreciate your help on that.

Senator Warner is on his way, and as you mentioned, he is very interested in what is going on in this area, so I want to wait until he gets arrives and permit him to ask any questions.

Mr. Cole, strong business involvement is a key ingredient if we are to successfully improve our workforce development system. Some believe that one of the detriments to greater business involvement is the unwillingness by some in the education community to form business partnerships in designing education programs. I would appreciate it if you would share our views on what your union is doing as well as from your own knowledge on trying to enervate people in the education community to join and try to work with the business community in stronger relationships.

Mr. COLE. Thank you. Let me first address your previous question. I might mention—and you have probably seen some of the studies the AFT has done on international standards, so we are looking very closely at what is expected of students in a variety of other countries so that we can actually give meaning to the term "world class," and then we can make sure that we are able to shape standards here that are equal to or better than the best in the world.

We do have one—and each member of the committee will be getting one of these from us, which is our latest report—which does have some international comparisons in it on school to work.

On the business involvement, the SCANS report contained a line that said that "Business and education are communicating with one another like two ships passing in the night. The problem is that one is using Morse Code and the other is using signal flags." In other words, they are not using the same language.

I think there is a growing commitment on the part of both to work together, and I am seeing that in a variety of areas. Certainly, I am seeing it in the work of the National Skill Standards Board and the engagement of employers. I think that one way to do that is to redouble our efforts through trade associations and business organizations that include large numbers, including small

and large businesses. Groups like the NAM, for example, I think can be very helpful in encouraging their affiliates to do it.

I can only speak to my experience in New York. We have worked closely under the leadership of your friend, Rick Mills, a guy who is doing a terrific job for us in New York—we are kind of sorry we stole him from Vermont, but he is doing a great job for us. We have, for example, two things going on. One is the School to Work Advisory Council which has been in place for some time, which is actually the follow-up of an earlier report we had where the Business Council of New York State, the AFL-CIO, and a number of other business, education and Government groups sat around a table collaboratively to talk about what we have in common.

We are now engaged in a 6- to 9-month process of developing a State workforce development system, and we have a design team in place. That effort is being led by Commissioner Mills and by Commissioner Sweeney from the Pataki administration and does include extensive involvement of labor, business and the other key stakeholders.

The key ingredient is that the role of Government and others can be as a facilitator to bring the two together at the table, and that is being done here around a common and shared goal.

From what I understand from business leaders as well as our own members, the key is that they want to be there in the beginning to help shape the process; they do not want to have something handed to them finally and be told, "Here, go do this." So that what we call for in our testimony is a collaborative partnership between business and education where they sit down and work things out together.

Now, I would argue that a workforce development system should be demand side-led. That is, if you are going to define the knowledge, skills and abilities required in the workplace, it is really only the employers in conjunction with their workplace partners who can define what those are. We understand that with the Skill Standards Board; they have got to be the lead part of the process. But I would argue that educators can contribute to that process because in some instances where businesses have done it alone, we find that the results are too narrow, that they are not broad enough and do not, for example, incorporate the academic components to that. So that if you have teachers, for example, at the table as you develop the skill standards, they can say, Well, look, you have got to make sure the language is something that I can understand as a physics teacher.

The example I frequently use is that it is quite common now to use statistical process control in a number of manufacturing areas. Well, we need to make sure this statistical process control is clearly defined in skill standards, but that is not enough. The physics teacher and the math teacher need to know what that means, what is the relevance for them. So they need to know what specific mathematical calculations, statistical calculations, you need in order to be effective in statistical process control so that they can teach that to the students. So they have to be able to understand that, and that has got to be communicated from the business sector.

I would also argue that, working in conjunction with the business community, they can then provide examples of how it is actually applied in the workplace, so it is not some theoretical thing, so that you can actually contestualize your learning. We can learn, as David said, from the Danes and the Swedes and others, who do it very, very well, where they will set standards nationally, and then they will send them down to the local area where they are implemented, and representatives of employers, of workers and of educators sit down at a table and say, okay, how do we organize our curriculum, how do we organize our pedagogy in a way to ensure that our students learn those kinds of things that the business community is telling us to do.

So I think that if they see that it is going to be real and that they are going to have some ownership in it, and we talk about a true partnership and not one where one is dictating to the other, at least in New York, we have had a great deal of success in accomplishing that, and I know we have in some other States as well.

The CHAIRMAN. I am sorry that Nancy Alley could not be here, because I know I used to use Mississippi—and I do not anymore—as an example of, thank God we are better than Mississippi. Then I went down there, and I found out that they were way ahead of us in meeting the challenges of the next century and that that was led by the teachers. It was not led by business, it was not led by the Government. It was led by the teachers. They organized and got passed—it was so incredible, I could not believe it—I think it was a 3 percent sales tax to be dedicated to education and to educating their workforce. Their unemployment has gone down notwithstanding the fact that they have lost hundreds if not thousands of jobs of a low-income variety to Mexico, and they have replaced them with high-skill jobs at $20, $30, $40 an hour.

And there was another reason I went down there which is called the Majority Leader—but anyway, I came back totally enthusiastic that it can be done. They start their young people in the 6th grade taking a look at various occupations that are available, and they have high-tech modules that they train in, where you can see them sitting in there with their earphones on, behind computer panels, and they are learning about medical technicians and all sorts of careers. I think they had nine modules at that time.

So I know it can be done.

Mr. COLE. Senator, one of the keys, which Trish talked about it in her testimony, and we would certainly support it, is encouraging work-based learning. If we can have effective, high-quality, work-based learning, that automatically brings the education and the business communities together. I suggested in our staff development model that we provide opportunity for staff development that brings workplace mentors and teachers together so they can jointly plan curricula and pedagogy and so forth.

The other point about work based learning is that we need to make sure that the academic knowledge and skills are made explicit there. That is a big problem I have, that a lot of work based learning is that they just go in and say they showed up on time and so on, and those lessons are valuable, but I think we can use this legislation to ensure that all work-based learning and other opportunities for young people to work have an education compo-

nent. That can even be done in the summer youth programs, for example—instead of just having kids show up with rakes and having them rake for 3 or 4 or 5 weeks and telling them, "That is good," and we give them a few bucks, which is important, and they learn some basic skills of getting along with people, there are ways to organize and restructure that.

Let us say you have six kids who are going to fix up a park, and you have $4,000 to do it. You could say, "Here is $4,000. Your job is to keep this park clean for 6 weeks. Using all aspects of the industry and the SCANS report, organize a report of how you are going to do that." There are academic skills there. There are mathematic skills there—what pay, what percentage of payroll—and you can begin to think—teamwork and problem-solving are engaged in that.

So we need to look at some way we can leverage even those kinds of opportunities for greater learning to go on in those opportunities that already exist.

The CHAIRMAN. Mr. Stern.

Mr. STERN. Yes, Senator, I would just like to add onto what Paul is saying. What we find in local programs is that somehow or other, they have found ways to provide some time for teachers to do the kind of planning to make this kind of innovation possible. It just cannot be done without that. And it is crucial that not only the vocational teachers be involved, but also the academic teachers, because that is what we are about. And I think that part of what might make that feasible in addition to whatever provision for actual funding of professional development is if the new legislation can give a clear signal that vocational education is no longer intended, as it has been traditionally, to prepare people only for jobs that do not require a baccalaureate or advanced degree. I think that academic teachers have tended to distance themselves from vocational education because it has been literally defined that way. If we can eliminate that distinction in law, I think we can provide a signal that this is a collaborative effort among the whole education community.

The CHAIRMAN. That is an important point, and I am glad you bring it up, because that is what I hope to do with this legislation is to try to blend the various vocational education as well as postsecondary—I call it "postsecondary" rather than "higher education," because I think it is a much better expression for the term. I think there is a report being worked on by the Department of Education on what they have observed and how they are blending the educational opportunities together in the European countries and not making the strong distinctions between higher education—in fact, in my own family, my daughter graduated with a baccalaureate degree and stood out there and said, "Hi, here I am. I have a degree in fine arts and art history," and waited a while, and then she went to the Maryland Institute of Drafting, got her drafting degree and ended up with a good job, and now she is getting her master's in architecture. So that the distinction really is not as relevant anymore.

Mr. MILLER. Mr. Chairman.

The CHAIRMAN. Yes, please, go ahead, Mr. Miller.

Mr. MILLER. I would like to address one other issue that Mr. Cole raised about the business community and the education community. I agree—I think that part of the problem has been ships passing in the night, and part of the issue has been the business community concern about being involved from the beginning. But I think there is a second issue, particularly from the perspective of the information technology community, and that is the time frame that people have when they are making decisions.

You mentioned the National Skill Standards Board started working in 1994—and this is no slap at them; I am just using them as an example. Before 1994, there almost was no Internet—I mean, there was, but it was just a few academics. Now there are 30 million people on the Internet. A whole new programming language, JAVA, which did not exist 3 years ago, is now very popular. We have gone in and out of a time when something called having HTML skills was important for being on the Net.

In other words, things happen so fast in the information technology world that the business community wants to see rapid action, and they want to see results. And to say there is another study and another study and another analysis and another benchmark and another study of benchmarks—the business community will just throw up their hands and say, "Wait a second—that is just not getting it done." They want to get it done. Let us look to a country like India which had no computer programmers 12 years ago, and now there are 250,000 of them because they decided to get it done, and now they have a very, very competitive workforce which is taking jobs from American workers—something which Senator Kennedy was referring to earlier—because they got it done; they made a commitment to get it done.

So that is also part of the different language that the education community and the business community speak, focusing on results and the need for particular results. And to some extent, I think that you and your colleagues have got to think outside the box a little bit if you are going to really come up with solutions, because if it is just going to incrementally change things, I think the business community is still going to wonder whether there really is a commitment on the part of the educational community to solving these kinds of crises. Unless there are some fairly dramatic, innovative ideas, I think you are not going to see a real commitment by the business community. They want to see real change and something fairly dramatic, and incremental change is not going to work.

As the Assistant Secretary said earlier, a lot of these educational paradigms are 50 and 60 years old. In fact, the university system is several hundred years old, and as former Governor Claude Kirk of Florida used to say, the only thing harder to change than a college curriculum is to move a cemetery. We have got to be in a situation now where college curricula can change overnight.

Last night, I had the privilege of sitting next to Dr. Alan Merton, the president of George Mason University, whom I know Senator Warner knows very well, who is one of the most innovative university presidents in the country, and he is out there every day figuring out how George Mason University can produce some of the knowledge workers that you referred to earlier, Senator, to make

sure that the 18,000 unfilled jobs in Northern Virginia's high-tech community get filled in a hurry, before this region begins to lose its edge as an information technology leader.

So I suggest that this committee, not just in the vocational education act, but also in the Higher Education Act, has got to start thinking outside the box a little bit because the challenge is simply too great. Incremental changes are not going to get it done, at least for our industry.

The CHAIRMAN. Yes, I agree with you 100 percent. Could you give us the national figure, while Senator Warner is here, for the number of vacancies?

Mr. MILLER. There are currently 190,000 vacancies in the information technology industry, and I know Senator Warner has been very involved in Virginia, where at least 18,000 have been identified in the Commonwealth of Virginia.

I spoke at a conference about a week and a half ago, referring to the local metropolitan area, Senator Jeffords, that was organized by the Potomac Knowledge Way, which is headed by Dr. Mario Marino, and at that conference they had the Suburban Maryland High-Technology Council, the Greater Washington Board of Trade, the Northern Virginia Technology Council, as well as representatives from many of the major universities and companies, and what they are trying to do is to come together as a region and focus on how to solve this as a regional problem. I would note that Dr. Merton is meeting with Dr. Kerwin, the head of the University of Maryland and with the head of Johns Hopkins University, with Dr. James Cook at Old Dominion University, another guy who is right on the cutting edge, using distance learning to teach students and turning out an incredible number of graduates in information technology. These are the exciting new ideas, and these are people who are thinking outside the traditional areas, and I know that Senator Warner's leadership has been very important and encouraging in doing these kinds of things.

The CHAIRMAN. I am glad to have him here. Just to fill you in, Senator Warner, I just mentioned that I intend to introduce legislation to help the whole metropolitan area here to enhance and make possible what Mr. Miller was talking about, and I will talk about that later. So please go ahead.

Senator WARNER. I would just observe that it has been my privilege to work with Harris Miller and the Information Technology Association of America, but I want to come back to one key word. You recited the figures for Northern Virginia, and then you went into the national figures—this is a national problem—I want to make that very clear—and it has certain focal points, Northern Virginia being one, obviously, California, Texas and other areas where there is a high concentration of those private sector entities doing technical work.

I will introduce Mr. Chairman, a bill calling for a national commission on information technology and the worker shortage. My concern is whether we in Congress are properly directing the significant contribution by the Federal taxpayers in a way to alleviate what today is a very critical problem. We have got to have a match between the training and the needs in the private and public sectors. That is what we have got to work on.

At the appropriate time, I will ask a question, but I am not sure that this is——

The CHAIRMAN. This is the appropriate time. Please proceed.

Senator WARNER. Yes, I am concentrating on the technical problem in my State, which has a mixed blessing in that, one, we have this burgeoning growth of high-tech in Northern Virginia, but we are not able in this geographic area to meet the needs with the young people and others to answer that call for public and private service.

But given the dramatic statistics that you have pointed out for high-tech and this commission on information technology as I have titled it, is there any other profession that is experiencing a similar labor shortage? In other words, is the medical profession experiencing it; is the teaching profession?

In fairness, no matter how strongly you and I feel about high-tech, let us not charge ahead without due recognition of other sectors which have comparable shortages.

Mr. MILLER. Well, I have got to admit to a certain myopia, obviously, since I represent the information technology industry. Certainly, there are some sub-segments of the health care industry, for example—Senator Kennedy referred to physical therapists, where there is a major problem.

Interestingly enough, Dr. Merton told me last night that he has a particular problem which is computer science professors, because the industry is paying so well now that any highly-qualified computer scientist with a doctorate can go out into the private sector and frequently make two, three, four, and five times the salary that he or she could be paid as a college or university professor. So that is obviously part of the problem, too, and Dr. Merton is very interested in that in terms of being president of a high-tech university and being a computer scientist himself.

In terms of other jobs, there was an article in the newspaper just 2 or 3 days ago about Midwest manufacturing plans. I cannot remember whether it was Indiana or Illinois, but one of those States is having trouble finding people who have the high-tech skills to work on factory floors—and not necessarily information technology skills, but the process skills that Mr. Cole was talking about before—to service them. Again, then all involve skill training.

Senator WARNER. Thank you. There are other areas, and we must address those areas.

Mr. MILLER. Definitely.

Senator WARNER. And I have to tell you a personal story. I wanted to be a liberal arts student, and I came out of the Navy in World War II, had the GI bill and so forth, and went to my father's university, Washington & Lee University, which was the foremost liberal arts college then and now and hopefully ever will be—a very small one—but nevertheless, I was driven into high-tech because I could not pass French. There was a 4-year romance language requirement, and I struggled for 2 years and just gave up and therefore went into a very small, modest physics engineering department and got that technical degree—the only one that that university awarded at that time that did not have a 4-year language requirement. They have since abandoned that degree, I hasten to

point out, so that we are sometimes driven into technical training for different reasons, but I am always pleased that I did do it.

That was a simple world which I came into after the war, but now we are in a one-world market, and while we sleep, the other half of the world is figuring out every way possible to steal our jobs, steal our quality of life, steal everything—maybe fairly, and sometimes not so fairly. Therefore, we have got to keep the manpower, woman power pool of trained persons coming out of our college and university structure to meet that fierce one-world market competition.

Mr. MILLER. I think you are very fortunate, Senator, because you have so many innovative thinkers in Virginia. The Assistant Secretary mentioned Thomas Jefferson High School. I am fortunate in that my son is a freshman at Thomas Jefferson, and I have been appointed to a PTA committee there to help bring the business community closer together with Thomas Jefferson. I put together plan with several other members of this volunteer committee, which the principal has signed off on, in general saying there is going to be a quid pro quo. He wants more technology voluntarily contributed by the business community, but the quid pro quo is that he is going to try to offer more training out of Thomas Jefferson because many of his faculty, even though they are high school faculty, are quite capable of teaching people skills for the market—he is going to offer that to the businesses community. He has the facilities; the school is generally open at night. He has faculty who say they are willing to do this, to train.

So now I am trying to act as a link between his interest in getting more technology into Thomas Jefferson and getting more up-to-date equipment and training and his ability to offer the business community, which is so desperate to get more training to fill the jobs they have in Northern Virginia, some training to them and make sure they have the workers they need. It is very innovative thinking.

Senator WARNER. I thank you.

May I salute you, Mr. Chairman. You will long be remembered as the chairman of this committee who tried to invigorate and put more thinking and stimulation into education than any of your recent predecessors, in my judgment. We are going to come out with some very constructive and, I hope bipartisan in every way, legislation this year.

The CHAIRMAN. I thank you, and those words will help greatly.

Mr. Cole, you mentioned professional development. To me, that is the key missing ingredient in the President's proposals and others as to how we can get a change in our educational system to meet the demands of the 21st century. How do we handle that? What is necessary, and what can we do to provide or ensure the provision of that kind of professional development to help improve our educational system?

Mr. COLE. Well, we will never get enough Federal dollars to meet all the professional development needs in the country, but I do think we have historically used Federal moneys to leverage State and local moneys, and that is what I think the Perkins reauthorization can do. So that as we look at formulas, we ought to have a requirement that there be professional development and, I would

argue again, professional development that includes, at the same time and not separately, academic teachers, vocational teachers and workplace mentors together to do that, and then there are all kinds of ways that we could provide incentives to States to begin to do that.

The other way to do it is to link with other sources of money. For example, in New York, we are using a very large percentage, under Commissioner Mills' leadership, of the Goals 2000 funds for professional development, and there are dollars available under school-to-work initiatives for professional development. So at the State level, this can and in many cases does all come together where we can use the Federal dollars to leverage other Federal funds and State funds and additional local funds to make sure that they are high-quality professional development programs.

For 23 years, I sat through superintendent conference days that were deadly and of little value to me. We have a situation now in New York where we have a network of what we call teacher centers, and those teacher centers are really operated by teachers who know best what they need, with some State funds and with some contributions by teachers who take courses in those situations. So I think we need to encourage those kinds of efforts.

The CHAIRMAN. Well, I do not want to interrupt you, but we have got to move along, and I feel sorry for the third panel. But what I am thinking is that the President has put $20 billion out there on the table in tax expenditures. If you talk about professional development, that should be something that you could get done in 3 or 4 years so you do not end up with a new program that is going to eat all of that up.

I am trying to think of ways, whether it be tax credits or whatever, to assist, and I would like to talk with Mr. Miller in just a second, too, about how the high-tech industry can assist us so that we can cut the costs and make it more efficient to be able to reach teachers with the kind of knowledge that we need to give them on these kinds of things.

Mr. COLE. There is one very excellent model—there are not many programs—where there is cooperation between industry and teachers, where teachers spend time in industry. In Buffalo, for example, in Western New York, GM and the Auto Workers have a terrific program where they bring teachers in to look at their plants in the summertime, and teachers, especially academic teachers, think they are going to see one thing—they think they are going to see a Taylorized, dirty, noisy, factor environment—and when they go into these modern factories and see all of the technology and how clean they are, they are absolutely amazed at the changing nature of that workplace and the knowledge and the skills that are required in that workplace. It gives them much better insight into what they need to do in their classrooms. This includes academic teachers.

So the degree to which we can promote those kinds of activities would be very helpful.

The CHAIRMAN. I want to work with the AFT to see what we can do, because time is running, and we have got to get some ideas. We have the zero to 3 situation that we have got to look at now, and 3 to 6, but the most important thing in those two areas is profes-

sional development, and I want to see us design a program that can provide for that professional development.

I feel sorry for the teachers who are being picked on, and I have a problem at home because I apparently picked on them last week, although I did not mean to, but they feel very vulnerable now, getting all this pressure to do all of these things, and they have got to go to school during the day and take care of the kids, and all of a sudden, they are supposed to change the whole curriculum.

Yes, Mr. Stern.

Mr. STERN. Very briefly, Senator, one way to leverage the use of money for professional development is through networks that exist. There is the SREB High Schools that Work Network, for example, with 500 schools mainly in the Southeast. There is CORD. There are career academy networks. There are others that are actively involved in promoting this kind of change. And somehow, providing support for those networks, I believe could have a multiplier effect.

The CHAIRMAN. I think so, and I am going to work with all of you.

Mr. Miller.

Mr. MILLER. Again, I think the attitude of the business community is that they cannot believe this is so complicated. They want to do this. Let me give you a couple of quick examples just in the last few days, Senator, of how frustrated the business community gets.

A major IT industry leader the other day told me that he has offered to provide at no cost to large numbers of Fairfax County school teachers free training on information technology—they will provide facilities, they will provide the faculty, they will provide anything that is necessary—and basically, he has gotten no response. This is at zero cost. They will do it for distance learning. And it is because there are so many rules and regulations and bureaucracy and so on and so on.

Now, that is not to say anybody is wrong here, but it just shows that because of traditional ways of thinking, it is tough to move this along in a way that would be very, very dramatic and successful. I think teachers would benefit greatly and would love to do it, but there are so many rules and regulations that nothing gets done.

As another example, a friend of mine just went into a major school district as an information technology senior executive, and he told me they spent 45 minutes arguing over a $50,000 budget item and eventually finished with that, and he said, "Look, here is my proposal. I want to spend 'x' million dollars"—I think the number was $5 million—"to do professional training for teachers in IT." They blew him away in 5 minutes, and the discussion was over. They said, "We will never get that much money," and they just gave up.

So this poor guy comes in with an innovative idea, and he is totally discouraged in his first couple of weeks on the job. Now, he should have known better. He used to work in the Federal Government, so he should have known that people were not going to jump up and down just because he had an innovative idea. But he thought he was being brought in to bring innovative ideas, and he had a fairly radical proposal, he thought he could sell it to the

school board and to the country officials, and the other people in the bureaucracy said, "Well, that is too grandiose thinking."

So again, it is thinking inside traditional ways rather than thinking outside of the box.

The CHAIRMAN. Right. We have got to get out of the box on these things, you are absolutely right.

Thank you all very much. I am sorry to have held you for so long, but it was very helpful to me, and I apologize to the third panel.

I would ask the third panel to come forward, please.

Rick Theders is president of Clark-Theders Insurance Agency in Cincinnati, OH, and he has been president of that agency for 20 years. He is a member of the American Vocational Association's School-to-Work Program and a member of Ohio's Department of Education Business Advisory Committee.

Dan Hull is president and chief executive officer of the Center for Occupational Research and Development, known as CORD. CORD is a nonprofit organization located in Waco, TX which conducts educational and occupational research, designs curricula, and directs networks of educators and employees focused on workforce education reform is also the author of numerous publications pertaining to technical education and workforce development.

Larry Rosenstock is director of The New Urban High School Project. He also lectures at Harvard Graduate School of Education on Federal vocational education policy, and he has been a principal and was a vocational education teacher for 11 years.

Gentlemen, I deeply apologize for the length of time that you have had to wait, but I think you probably found the information somewhat interesting as well.

Mr. Rosenstock, why don't you start off?

STATEMENTS OF LARRY ROSENSTOCK, DIRECTOR, THE NEW URBAN HIGH SCHOOL PROJECT, CAMBRIDGE, MA; RICK THEDERS, PRESIDENT, CLARK-THEDERS INSURANCE GROUP, CINCINNATI, OH; AND DAN HULL, PRESIDENT AND CHIEF EXECUTIVE OFFICER, CENTER FOR OCCUPATIONAL RESEARCH AND DEVELOPMENT, WACO, TX

Mr. ROSENSTOCK. Well, there is a benefit to going last, because you do not have to say a lot of things that have already been said.

Senator Jeffords, you spoke earlier about this quizzical thing about how it is that students in work-based learning programs get reengaged into their school-based programs which perhaps have not changed that much, and it reminded me of a story about this time last year when I was asked to speak to the Worcester Chamber of Commerce in Massachusetts. I brought several students with me, and one of them had spoken, Lashonda Bailey, and at the end of her remarks, somebody said, "Lashonda, you just said that last year, you were absent 36 times, and this year, while you have been doing this internship at Polaroid, you have only been absent three times. I understand why you are engaged at Polaroid. You have told us—you are around adults doing real work—but you have also told us that you are doing much better in your courses back at school, and you never did before. Why is that?"

And she said, "Well, you know how we teenagers think we know everything? Well, going to school does not change that, but when

you are around an adult, doing real work, you realize that there is a lot you do not know and need to learn, and when you get back to school, you come to figure there is a bunch of it that you can pick up back there."

I think that Lashonda describes well the best of what school-to-work is about.

I have been in 23 cities in the last 3 months on The New Urban High School Project. When I got to the 23rd city last week, which was Durham, NC, I met the mayor in the morning, and I was going to be speaking to her again in the afternoon. I said, "I am about to go over to the Health Academy at Southern High School, and I can predict that about 85 percent of the graduates of the Health Academy will be going on to postsecondary, and about 70 percent of the high school cohort at large will be."

I was pretty close—90 percent of the Health Academy graduates are going on, and 72 percent of the high school graduates at large are going on.

At my school at Ringe, over 6 years, we had a 99 percent completion rate in the internship program at Polaroid, Harvard Real Estate, six banks, three hospitals, a Careers in Education Program with Lesley College, and 85 percent of those completers went on to postsecondary. I am seeing that in school after school across the United States, and I think this suggests that the tag line for school-to-work perhaps should have been: "School-to-Work: It is Better College Prep than College Prep."

But that is not the tag line, as David Stern has described; it really comes from the vestigial act of 1917 of Smith-Hughes which carries forth today in Federal vocational policy, with this notion of this being for nonbaccalaureate degrees.

So I am somebody who sits before you who thinks there should be no programs for the noncollege-bound. Even though we know that the greatest predictor of who does not go on to college is the income and education level of one's parent, as John Dewey said, the purpose of public education is to transform society, not to reproduce it. And if you take somebody in the 9th grade, and you put them in a program for the noncollege-bound, guess what—they are not going to go to college. But if you take Lashonda Bailey, and you put her in a program where we are expecting her to go, and you do the right things with the right activities, they do go, and she is there today.

It is not just my anecdotal evidence on this. This is backed up by Bob Crane's research around career academies at Columbia and the MVRC research. So one problem with consolidation or the notion of consolidation which is spoken about in some quarters is merging vocational education with workforce development. If you look at Tom Bailey's research from Columbia which was mentioned earlier, the problem with Second Chance programs is that they do not look more like first chance programs; they do not have literacy, numeracy, long-term counseling. If we merge workforce development and education programs, you risk making what is at core an education program look more like a workforce development program.

I think that people who want to create programs for the noncollege-bound are well-intended about wanting to do something for

those kids, but it is axiomatic that we only expect lower-income kids to predict their future occupation at the age of 15 and not middle and upper-income students.

I know that if someone had asked me at 15 what I was going to be doing and had told me I would be spending my adult life in a high school, I probably would have ended it right there.

Vocational education and school-to-work are in my view two wings of the same bird. One wing, school-to-work, is the exportation of the student to the workplace, and the other, vocational education, is the importation of the workplace to the student. They are both build around a core of rigorous academics because it is about literacy and numeracy after all, and that is what the employer community tells us for the most part.

So I would end on the cautionary note that when we do this technical skill training, we not make it too tightly tailored to HCMI, and then find out that JAVA came along and has changed the landscape.

I spoke last week at the American Association of Community Colleges and found that there were quite a few sessions addressing your daughter's circumstance. They call it "reverse registration." There is quite an incidence of students who are getting their B.A.s and now going back into community colleges to get technical training. As Paul Harrington's research at the Center for Labor Market Studies at Northeastern has shown, students who have technical and academic skills do far better than those who merely have one or the other.

Thank you.

The CHAIRMAN. Thank you, Mr. Rosenstock.

[The prepared statement of Mr. Rosenstock follows:]

PREPARED STATEMENT OF LARRY ROSENSTOCK

1. *Preparation of students for high performance work requires the integration of vocational and academic education, and the integration of school based and work based learning. Neither can be achieved or sustained without substantial school change.*

a. We cannot adequately prepare students for high-performance work organizations unless we transform schools into such organizations. We must move from the typical factory-like scale to smaller, more flexible units with greater autonomy, diversification of staff roles, flatter organizational chart, substantial resources for staff development, and a project-based curriculum.

b. Carnegie-unit, time-based secondary exit (and post-secondary entrance) requirements maintain a subject-status hierarchy which inevitably relegates vocational education, school to work, etc. to second class status. Integrated learning (within school through Perkins, and connected to work-based learning through school to work) must be imbedded in exit/entrance requirements.

2. *Vocational and academic integration must be deepened.*

a. Integration employs the best of each (vocational methods and academic content) to restructure and detrack high schools. Without vocational education, the role of work in one's life and in society would be silent within the high school curriculum.

b. Staff development (and new teacher training) should cultivate technical *and* academic proficiency for all teachers (whether formerly vocational or academic).

c. Standard-setting by discipline risks working against cross-disciplinary integration.

3. *Industry-based teaching and learning must be pursued as an antidote to narrow skill training for specific occupations.*

a. Low rates of employment related to high school occupationally-specific training, and increasing rates of labor market churning, indicate substantially reduced utility of narrow, technical skills.

b. Broad, industry-based learning is more transferable (portable) to multiple work environments.

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c. School-based enterprises (currently in 22 percent of high schools) are a more effective platform for "all aspects of the industry" instruction than a typical shop (with decontextualized, technical skill training).

4. *Vocational studies should be seen as an education—rather than a training program.*

a. Industry wants graduates who are educated, not trained (industry can train, if graduates have literacy, numeracy, communication skills).

b. "Second chance" employment training programs typically fail because they lack the longer term exposure to academics and counselling of "first chance" programs.

c. So (above), and lower wage and job placement rates of vocational graduates (compared to their academic counterparts), indict vocational education as a training program. Cognitive research (Berryman, Gardner) affirms the strength of prominent vocational pedagogy (e.g. master apprentice, experiential, applied, expeditionary, multiple intelligences) afterward, team taught, cooperatively learned, performance-assessed). (The strength of vocational pedagogy is under-appreciated even by vocational educators, especially when they focus exclusively on entry level job outcomes.)

d. No programs for the "non-college bound". Vocational education and school to work are not a path to a different place, but a different way to learn the same things that all students need to learn. We cannot predict who is going on to further education, and when we do we institutionalize self-fulfilling prophecies (by income level) of certain students' supposed limited potential (note strikingly high college-going rates of school to work graduates).

5. *New teacher training and certification must be reexamined to take advantage of the large upcoming turnover of the teacher work force.*

a. Teacher education and certification tend to remodel what went before, and don't benefit from recent cognitive research about understanding.

b. Master apprentice pedagogy (which predates schools, is universal, and is effective) is missing from most school of education curricula and teacher certification requirements. Also missing are elements relating to teachers collaborating with "outsiders" (community partners), and to cross disciplinary teaching and assessment.

6. *One of the reasons schools don't work is that unlike industry, they have little or no research and development capacity.*

a. Practitioners need exemplars who can demonstrate effective teaching and learning. It is of critical significance that new methods and programs, "on the ground", be developed and shared. For relatively little money, the Federal Government has played a pivotal role in supporting significant innovation in education.

b. Competing interests at the State and local level, and institutional pressures toward stasis, make locally funded research and development very difficult and rare.

c. The Federal Government has a crucial role, not in telling States and locals "what to do", but in raising expectations so as to further our national interest in having a well-educated citizenry.

7. *Every nation, within the new global economy, is under irresistible pressure to increase the learning levels of all of its people.*

a. It makes sense politically and socially, and it is critical economically, that nations develop the technical literacy of their people.

b. In all developed nations and most underdeveloped nations, the Federal Government is understood to be an essential force for the coherent advance of teaching and learning.

The CHAIRMAN. Mr. Theders.

Mr. THEDERS. Good afternoon, Mr. Chairman. My name is Rick Theders, and I am president of Clark-Theders Insurance Group, a small business of 14 employees in Cincinnati, OH. I do appreciate the opportunity to talk with you today about an issue which is very important to me, which is vocational education.

My wife, an elected school board member, and I have been active over the years in the public schools that our children have attended. At the national level, I work with the American Vocational Association, a professional organization that represents 38,000 vocational educators from around the Nation. I am a charter member of the AVA's Corporate Partners Advisory Group, which is working with AVA to rethink the way America does business with education.

The 44 corporate partners, ranging from large companies like General Motors, Boeing, MetLife, and the newest as of this week,

Motorola, to small companies like mine are committed to making sure that vocational education serves students, employers and our community needs.

What brought me to AVA and this national effort is my local experience with Great Oaks Institute of Technology and Career Development. Great Oaks is the vocational-technical component of the public school system in southwest Ohio. It offers 60 career majors at four different career campuses. By the time students complete the 2-year high school segment of the program, they have worked approximately 2,200 hours on the job, in addition to their 1,300 hours of school-based instruction. Great Oaks also offers post-secondary education opportunities to some 70,000 adults.

Since 1978, my business has taken on 10 different student workers. Three have become full-time employees; others have found employment elsewhere, and others decided to choose college before selecting career. But all of them have completed their education with real life, on-the-job experience.

Industry plays a vital role in determining career majors offered at Great Oaks, as well as the competencies that students must acquire in each program. In addition, businesses offer school instructors opportunities for work-based externships to keep their industry and knowledge skills up-to-date.

With strong support from the State and local education officials, Great Oaks makes it possible for business people to develop a meaningful partnership with education. The school assumes all the responsibility for matching students with employers, facilitating the agreement among the employer, the student and the school, and before a student arrives in my office, my staff meets with the school counselor to outline expectations and responsibilities of the jobs, which include three basic commitments: our commitment to train and mentor the student to help them deal with a career choice, to get a feel for the job and hopefully become more interested and excited about their education and career direction; our commitment to report back to the school on a weekly basis, and the school's commitment to send us a student who can perform basic office skills, is willing to take on a variety of assignments and able to participate in the team effort in our office.

I believe that supporting vocational education programs benefits both the students and local businesses. Because the students are well-prepared, my company benefits from their immediate productivity.

As I sit in this room, where you are faced with billion-dollar decisions that affect millions of students, parents and educators, I am really in awe of the responsibility. In spite of my smaller scale of contribution to vocational education, I know that I too am making a difference as are many of my colleagues in the small business community. I also know that in partnership with educators, students and parents, small business plays a vital role in preparation of our Nation's workforce and the position in the world economy.

Vocational education is a critical element of our Nation's education system. It can and does work, and together, we can make it work even better. I urge you through Federal policy to reach out to companies like mine, to strongly support the recommendations forwarded to you by the American Vocational Association, including

finding new and improved ways to bring business expertise and assistance to vocational education. It is in all of our best interests as parents, educators, students, employers and policymakers to strive for the best education system possible.

My experiences with vocational technical education have been totally positive, and I am committed to continue to strengthen my relationship both locally with Great Oaks and on a national level with the AVA.

The results of our efforts are so important to our economy and to our children and our grandchildren's future. That is what makes this session today very important.

Thank you.

The CHAIRMAN. Thank you, Mr. Theders, for a very excellent statement.

[The prepared statement of Mr. Theders follows:]

PREPARED STATEMENT OF RICK THEDERS

Good morning, Mr. Chairman and members of the committee. My name is Rick Theders and I am President of Clark Theders Insurance Group in Cincinnati, Ohio. I greatly appreciate this opportunity to be here today to talk with you about an issue that is very important to me—vocational education.

CLARK THEDERS—LOCAL AND NATIONAL COMMITMENT

Clark Theders is an independent insurance agency that serves business, public and personal insurance needs throughout southwestern Ohio. Founded in 1950, Clark Theders Insurance provides property, liability, vehicle and employee benefits. Our clients include numerous school, municipal, manufacturing and industrial accounts. Our staff of 14 employees is committed to quality insurance products, customer attention and personal caring service.

My wife, who is an elected school board member, and I have made it a point to be active over the years in our public schools that our children attended. At Clark Theders, we also have a strong commitment to education. As I handle the insurance needs of the Great Oaks Institute of Technology and Career Development, when the school began to expand its work based learning opportunities for students it turned to my company for assistance. Our firm now employs student workers who work afternoons during their senior year.

At the national level I also work with the American Vocational Association (AVA), a professional organization representing 38,000 vocational educators from around the nation. Clark Theders is a charter member of AVA's corporate partners advisory group, which is working with AVA to rethink the way America does business with education. The 43 corporate partners, ranging from large companies like General Motors, Boeing and MetLife to small businesses like mine, are committed to making sure that vocational education serves students', employers' and our communities' needs.

BUSINESS INVOLVEMENT—HOW IT WORKS AT GREAT OAKS

What brought me to AVA and this national effort is my local experience with Great Oaks. Great Oaks is a vocational-technical component of the public school system in southwest Ohio. It offers approximately 60 different career majors at four strategically located career centers. While a number of career majors are offered at each operational center under the umbrella of eight career clusters, each one also has unique career majors that are linked to the geographic region it serves.

Industry plays a vital role in determining the career majors offered as well as the competencies students must acquire in each program. In addition, businesses working with Great Oaks offer the school's instructors opportunities for work-based externships to keep their industry knowledge and skills up-to-date. Great Oaks instructors are permitted to spend one 40 hour week each year in an employer setting to further connect the world of work with the education process.

Great Oaks' apprenticeship program, in which my business is involved, links secondary and postsecondary education, business, industry, labor and government to provide a pathway for students to pursue further education opportunities or move directly into careers. By the time students complete the two-year high school segment of the program, they will have worked approximately 2,200 hours on the job—the equivalent of more than a year of full-time employment—in addition to their

1,800 hours of school-based instruction. Great Oaks also offers postsecondary educational opportunities for more than 70,000 adults.

My working relationship with Great Oaks dates back to 1978, just a year her I bought the insurance agency. That year I welcomed my first "co-op" student to the office. Co-operative or "co-op" education, as you know, combines work-based and school-based learning. Since that first year, I have taken on 10 different student workers. Three have become full-time employees and are working their way up the career ladder at my insurance agency. Others have found employment elsewhere and still others decided to enter college before starting careers. But, all of these have completed their education with "real life on the job" experience.

EFFECTIVE BUSINESS INVOLVEMENT MADE EASY

With strong support from State and local education officials, Great Oaks makes it possible for people like me, who are busy running a business, to incorporate a meaningful education partnership into our work environment. The school assumes responsibility for all phases of the student selection, matching the students with employers and facilitating the agreement among the employer, the student and the school. Before a student arrives at my office, my vice president of operations meets with the school counselor or instructor to outline expectations and responsibilities of the job. These include three basic commitments:

- Our commitment to train and mentor the student during the co-op assignment to help a young person "live" a career choice, get a feel for the job and hopefully become more interested and excited about their education and career direction;
- Our commitment to report back to the school on a weekly basis; and
- The school's commitment to send us a student who can perform basic office skills, is willing to take on a variety of assignments and is able to participate in the team effort in our office.

Once we have refined our expectations, the student begins work. In our office, the students are paid an hourly rate above the minimum wage. While some programs offer unpaid work experiences to students, I believe in paying the students. It establishes a professional relationship and reflects a real commitment and obligation on the part of both the student and the employer.

Co-op education makes sense to me. I believe that supporting co-op vocational programs benefits both the students and the local businesses. From the business perspective, it's an easy sell. I get to screen potential employees while giving students valuable experience in testing career options.

A WINNING COMBINATION

Because the students who attend Great Oaks are well prepared, my company benefits from their immediate productivity. They are skilled in the use of office procedures, current versions of computer technologies and have been taught academic skills as well as personal, interpersonal and analytical skills like getting along with others, problem-solving, critical thinking and working in teams. Moreover, they demonstrate a strong work ethic and a clear understanding of the expectations of the employer when they start the job.

Not only does vocational education benefit employers, but schools and students benefit, too, by working with small businesses. School personnel who work with small businesses do not have to cope with a complex bureaucracy or a human resources department. They normally will deal with just one person on the staff who knows the whole business very well and can answer any questions.

In a large company, a student might be pigeonholed in a certain area and see and learn only about one aspect of that business. A student working in a small business, even for a short time, will see all aspects of an industry. This broad but detailed view helps students further refine their career goals. And there are just more small businesses (under 25 employees) in every community whose employees and children attend the local public schools.

CONCLUSION

All the small businesses in the United States, if taken together, would constitute the third largest employer in the world. The need for education to supply the workforce for these enterprises is great. The future of our communities, our nation and the world economy is bound tightly to the ability of small businesses to succeed, and for the future growth depends on a well prepared competent local workforce.

In my concluding remarks, I am going to make a few assumptions about my appearance here today. I assume that you wanted a representative from small business to testify because you already are well aware of the significant employment opportunities that small business provide in the United States. As employers, we know first-hand about the education that our schools are providing to our future employees. I assume also that you wanted a real life example of how a small business can be a partner to education in our nation. In my insurance business I call on many types of businesses—manufacturing, construction, technical, retail and public

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types—that have a common thread of both need for skilled, educated employees and a desire to help their community. As our local communities grow and prosper, so shall our businesses. It's a "win-win" situation.

As I sit here in a room where you are faced with multi-billion dollar decisions that affect millions of students, parents and educators, I am in awe of your responsibilities. In spite of the smaller scale of my contribution to vocational-technical education, I know that I am making a difference, as are so many of my colleagues in the small business community. I also know that, in partnership with educators, students and parents, small businesses play a vital role in the preparation of our nation's workforce and our position in the world economy. Vocational education can and does work, and working together we can make it even better.

I urge you, through federal policy, to reach out to companies like mine. I strongly support the recommendations forwarded to you by the American Vocational Association. In addition,legislation should include encouragement for:

- strengthening and expanding work-based opportunities for students and teachers;
- increasing private sector participation in vocational-technical education;
- developing voluntary industry-recognized skill standards and expectations for career fields to guide educators in keeping curricula current;
- integrating academic, occupational and employability-skills education to ensure that students are equipped with the skills they need to succeed in careers and further education choices; and
- providing increased authorization levels to enable these efforts to move ahead in all areas of the country.

It is in all of our best interests, as parents, educators, students, employers and policymakers, to strive for the best education system possible. My experiences with vocational-technical education have been totally positive and I am committed to continuing and strengthening my relationship with Great Oaks and AVA. The results of our collective efforts are so important to our local and national economy and to your and my children's and grandchildren's future. That makes our efforts today so very important.

Again, the you for this opportunity to testify before this committee. I will be happy to answer any questions you may have.

The CHAIRMAN. Mr. Hull.

Mr. HULL. Thank you, Senator Jeffords. I appreciate the opportunity to speak on what I consider to be the most successful element of school improvement in 40 years, and that is the Tech Prep associate degree movement.

Let me tell you about my background. I am a registered professional engineer. I practiced for 14 years in the areas of Pennsylvania, Maryland, New Mexico and Texas. A little over 20 years ago, I was an engineering manager in the laser optics and telecommunications field, and I could not hire the kind of lab technicians that I needed. I needed people who knew why as well as how they were doing things. We needed people with a combination of head and hand skills.

I changed careers at that time and entered the workforce education area in 1974 to work in this field. I believe that what we are doing throughout the country in the area of tech prep is moving toward the realization of this goal.

CORD operates with about 140 people. We operate through the country and in seven countries around the world, particularly in the development of curricula and teacher training. We have developed many of the applied academics courses in physics, mathematics, biology and chemistry that are being used in the workforce education areas.

Before I get into the rest of my testimony, let me key off of a point that was made in the last panel in the area of teacher training. I think this is incredibly important. We at CORD and other places can develop all the curricular materials in the world, but if we do not provide the professional development and teacher train-

ing that is needed, we will not bring these reforms about. We have got to look at more effective, more efficient, less costly ways to do it and do more of it.

I am proud to say that we have been involved in teacher training for about 4 years. We build a teaching center in Waco, and over 2,000 teachers have come there to learn new techniques. Everybody, unfortunately, cannot come to Waco, TX, and we need a lot more than 2,000 people.

Last year, we build a virtual teaching center using video conferencing equipment, and today we are releasing a video conferencing educational directory. There are over 840 sites throughout the United States where teachers in high schools and community colleges can go to receive instruction over this medium. We were involved in six or eight different conferences teaching in this way, and we are doing research in this area as well. We can do this for $60 an hour. It does not matter whether we are doing it in Vermont, Oregon, or Texas. I think that this network will grow and will be a very important tool in teacher training.

We manage the National Tech Prep Network, which is a grassroots network of thousands of secondary and postsecondary schoolteachers and administrators and employers who are involved in the tech prep associate degree program. It works with its thousands of members to provide leadership in the field, to disseminate best practices, to assist in designing applied curriculum, to train teachers, and to expand partnerships between high schools and community colleges.

Tech prep maintains a strong academic base, and it opens options for students by preparing for further education. This committee and Congress saw fit in the last reauthorization to provide funding for tech prep, and I think it has done an enormous amount of good in the last 6 or 7 years. It is a reform strategy that works, has major impact on secondary and postsecondary education and has resulted in systemic change in education as it develops new curricula and teaching methods.

We were talking about examples of success. We have a Tech Prep Newsletter, and for the last 6 months, we have asked States to write about what is happening in tech prep and how well it is progressing, and I have reports that I would be happy to share with you.

The CHAIRMAN. I would appreciate it if you would do that, and I will make them a part of the record. That is very helpful to us.

Mr. HULL. I have them from 13 States, and I will provide those to the committee.

[At press time the reports referred to were not submitted. When received, they will be found in the files of the committee.]

Mr. HULL. Let me tell you why tech prep is working, and there are six reasons. One, it is based on a solid academic foundation. We do not believe that you can just teach hand skills; you have got to combine them. That is what I needed when I was an engineering manager, and I think that that is true in all fields. We know now that we can match teaching styles to learning styles. We are a lot smarter about that than we were 10 or 12 years ago, and we have a lot of good evidence from universities and others who have evalu-

ated the performance of students in these areas. It is working, and we know that it can continue to broaden.

Tech prep is helping hard-to-reach students succeed in school. We have not been successful in reaching many of our students and providing this to them. Tech prep is doing this by including an occupational focus. We are answering many questions that students entering high school who are trying to decide if they want to continue in school or not are asking: Why do I have to learn this? How am I going to use this in my life? I think that that is important.

Tech prep is innovative, and it is flexible. It is free from a lot of bureaucratic mindset in education. It has moved beyond that. It is making a leap forward. The Federal funds that have been provided in the last 6 years have leveraged support from the local education agencies, States and businesses.

Tech prep is meeting the needs of business by preparing workers with the necessary skills. I will cite one example which perhaps you have heard about, and it is the Boeing example. Six years ago, Boeing put $7 million into tech prep in the Greater Washington area. Last year, Boeing was able to hire the first students coming out of the Four-Plus-Two program. They give a test to their applicants, and the average score is 74; the tech prep students were able to score 95 on that test. Boeing is very pleased, and they feel like they are getting a return on their investment.

Tech prep is not tracking students, it is providing opportunities for them to go on. And the biggest opportunity to go on into higher education is to make sure that you have recognized achievement in academic fields. This past year, the NCAA ruled that many of the applied courses that had been taught should be recognized by higher education. That opens a door that says that if my student goes into this, it is not a dead-end situation.

Let me just briefly give you some recommendations for reauthorization of tech prep. One, I believe it is important to keep tech prep as a separate categorical program with increased funding so that we can maintain its identity and continue to move this reform forward. It needs another 5 years of growth. I think it is growing well now.

We need to increase the strengthen the partnership between secondary and postsecondary. The community colleges are now getting the high school students who have gone through these programs, and they are starting to adjust their programs in a significant way.

We need to continue to integrate the academic, industry and employability skills into the curriculum. I think curriculum will be very important. We are working on that right now with 25 States, and that needs to be expanded.

I have already mentioned professional development.

I think accountability measures should reflect the needs of industry in addition to the basic academic skills. And finally, indications of student performance should also have forms of assessment that reflect individual learning styles.

Thank you very much for very helpful testimony.

[The prepared statement of Mr. Hull follows:]

PREPARED STATEMENT OF DAN HULL

Mr. Chairman, members of the committee, thank you for the opportunity to testify before you today on the reauthorization of the Carl D. Perkins Vocational and Applied Technology Education Act. I appreciate being invited to this hearing and thank you for taking the time to learn more about vocational technical education and the important role that the Perkins Act plays in improving occupational education for students in the United States.

I am Dan Hull, President and CEO of the Center for Occupational Research and Development, or CORD, as we are commonly known, located in Waco, TX. CORD is a national nonprofit public service organization that develops ad disseminates educational reform strategies, skills standards, and contextual academic curricula, with a primary focus in mathematics, science, and technology. One major project we run, the Integrated System for Workforce Education, is developing a curriculum that integrates academic, industry, and employability skills.

CORD also manages the National Tech Prep Network, which is a grassroots network of thousands of teachers, administrators, and employers, involved in the Tech Prep Associate Degree program. We hold annual conferences to disseminate best practices throughout the Tech Prep community, assist in designing applied curricula, train teachers to use the applied curricula, ad provide significant leadership to the field in terms of policy development, development of business support, and above all maintaining a strong focus on the academic foundation of the Tech Prep program.

I am a registered engineer in the State of Texas. I practiced 14 years in the fields of laser/electro-optics and telecommunications. While I was an engineering manager for an aerospace firm, I found that we could not hire appropriately educated and trained technicians. Even though they were very good in the labs with tools and procedures, they did not understand the basic technical principles; ie, "they knew how but not why." This limited their usefulness and made it difficult for them to learn new technology as it emerged. In 1974, I changed careers and entered educational research ad development in hopes of improving what is taught and learned for technicians. I believe the reform efforts for vocational and technical education in the last 10 years are beginning to deal with the problem of my concern.

Mr. Chairman, you and your colleagues on this committee are well aware of the challenges we face in preparing and developing the highly skilled workforce needed by business in today's competitive, global economy. Business increasingly needs workers who have solid academic ad communication skills, as well as interpersonal, and technical skills. These needs will not be disappearing anytime soon. It is up to our schools and colleges to help meet these business needs by preparing workers who are ready to begin careers in complex team-driven, customer-sensitive, and technology-dependent workplaces.

The Carl D. Perkins Vocational and Applied Technology Education Act has had a significant impact on vocational education, particularly with the reforms included in the last reauthorization of the law in 1990. In particular, the enactment of the Tech Prep Associate Degree program has brought about major and lasting changes in high schools and community colleges throughout the United States. With leadership from Dale Parnell, now Professor Emeritus at Oregon State University, and many in Congress who saw the wisdom of developing programs aimed at "the forgotten half", Tech Prep has quickly become a significant pathway to education reform for high schools. At CORD, I have worked closely with Dale Parnell to further the vision of the Tech Prep Associate Degree program and to ensure its success. Based on my experience at CORD and with the National Tech Prep Network, I would like to focus the remainder of my testimony on the Tech Prep program.

Very simply, Mr. Chairman, no other education reform initiative has, in my opinion, developed a greater or more widespread grassroots support by students, parents, teachers, principals, counselors, community college faculty, employers, and the local community. Tech Prep's contribution to education and career preparation has made more progress in 6 years than most any other Federal program I know of. This Federal investment has created a culture of innovation, responsiveness to students aNd the business community, aNd performance.

Tech Prep works for several reasons:

(1) Tech Prep is based on a solid academic foundation. All Tech Prep programs have a strong focus on math, science, and English and communication skills. What distinguishes Tech Prep from general education or college prep courses is that they are taught in an applied, contextual manner. We know from research that many, if not most, students learn better with applied, contextualized curricula. Tech Prep teaches the same material, but does so in a manner better understood by most

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students. And, since students receive a solid academic education, not one that is watered-down, they have no problem pursuing a higher education.

(2) Tech Prep helps hard to reach students succeed in school by making connections for them. Every Tech Prep consortium has numerous examples of students whose school careers were turned around after participating in Tech Prep programs. Students begin to understand the value of what they are learning in school and how it might apply to a job or career. While national data on how many students have decided to remain in school and not drop out after being involved with Tech Prep is not available, many local programs have shown decreased dropout rates and increases in the numbers of students attending postsecondary education. Parents, also, see the change in their children's attitudes about school and have become great supporters of Tech Prep. Lastly, Tech Prep keeps open a range of possibilities for students, in terms of both work and continuing education.

(3) Tech Prep is a new concept in education, and as such, is free to break away from convention and try innovative, experimental designs. Because Tech Prep is a program separate from the basic state grant under Perkins, local consortia have been able to create very flexible partnerships and programs, with a focus on an integrated curriculum developed with academic and vocational teachers and faculty, and articulated to postsecondary education. Tech Prep consortia tend to exhibit entrepreneurial characteristics and try very hard to meet the needs of local business. The flexibility of the program and the freedom from the basic grant program allow teachers to be more creative and to work more closely together also. As a result, Tech Prep has reached into the classroom to change the way teachers teach and the way school is organized.

(4) Tech Prep is meeting the needs of business by preparing workers with necessary skills. Increasingly, Tech Prep programs are working closely with local, state, and national business organizations to infuse industry standards into the curriculm, especially at the postsecondary level. Students emerge from Tech Prep with not only good academic and technical skills, but employability skills—traits highly desired by employers. The Boeing Company in Seattle, Washington, a long-time supporter of Tech Prep in its area, has just hired the first graduates from their Tech Prep program. Boeing found that Tech Prep graduates are exceptionally well-qualified for entry-level jobs, and according to a Carver Gayton, Boeing's former Corporate Director, the Tech Prep students scored in the 94th percentile on assessment exams given by Boeing, compared to the 68th percentile scored by other applicants. Mr. Gayton has also indicated That Boeing expects these Tech Prep students to need less training, therefore saving the company money in training costs.

(5) Tech Prep creates systemic and lasting partnerships at the local level. For the first time, racial barriers in education, such as those between academic and vocational programs or between middle, secondary, and postsecondary levels are avoided to support a common agenda.

Quality of teaching and curriculum are improved with this type of communication across the system. Academic and occupational teachers have a greater understanding of the material they teach; high schools and community colleges work together to move students through the educational programs in a nonduplicative and integrated fashion.

(6) Tech Prep is accountable. In individual consortia, students are tracked to determine their outcomes. Most consortia find That "Tech Prep seems to increase the percentage of high school students who pursue higher education, reduce the dropout rate, and increase achievement test scores" (Alabama 1995 Annual Vocational Education Performance Report). Another said "the considerable reduction in student failure rates in mathematics and languages arts can be directly attributed to the introduction of applied mathematics and applied communications. Some schools report student failure rates have decreased by as much as 80 percent in 9th grade math classes." (Arizona Tech Prep report, 1995–96).

For these and other reasons, Tech Prep has been embraced by American communities. A recent study by Mathematica Policy Research indicated that close to "1,000 Tech Prep consortia were operating in 1994 and included more than half of all U.S. school districts and three-quarters of all U. S. secondary school students. Moreover, most two-year community and technical colleges, as well as a growing number of four-year institutions, are members of the Tech Prep consortia." States across the nation have experienced dramatic growth in Tech Prep, either expanding existing programs or building new programs in new communities, thanks to the federal funds from the Perkins Act. Funding from the Perkins Act has also allowed state education agencies to play an important role in the development of much-needed professional development programs, new curriculum, and to provide leadership to local education agencies and in creating partnerships with the business community and postsecondary institutions.

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Finally, let me address the relationship of Tech Prep and the School to Work Opportunities Act. Tech Prep and School to Work, or school to career, are two distinct programs, yet with many common goals. Since 1990, Tech Prep has been building the foundation for what could now be called a school to career system. Many states are using their Tech Prep consortia as the base for their school to career activities, and are relying heavily upon the curriculum already in place. Tech Prep provides the academic rigor necessary for school to career programs. Tech Prep gains by having increased access to the private sector and work-based learning opportunities for students. As long as the School to Work Act receives funding, the two programs will continue to work closely together. Increasingly, we are seeing that Tech Prep programs that on their own are building work-based learning opportunities for students into their programs as a matter of course, and over the next few years, business participation in the Tech Prep program is expected to increase.

Recommendations

On behalf of the National Tech Prep Network, I would like to make the following recommendations for the reauthorization of the Perkins Act.

1. I emphatically urge you to keep Tech Prep as a separate categorical program, with its own funding stream. The identity of the Tech Prep program across the nation is truly impressive, and this separate identity has allowed educators and business leaders to create innovative, flexible, and accountable programs. I also urge you to increase the level of Tech Prep funding.

2. Articulation between secondary and postsecondary institutions needs to be emphasized in order to build a seamless system. Postsecondary institutions need encouragement to focus on reform at the college level consistent with changes at the secondary school level.

3. Emphasis should be put on the integration of academic, industry, and employability skills (such as SCANS) into the curriculum and pedagogy at the secondary and postsecondary levels. This curriculum should be designed to expand students' options into career pathways that lead to specific occupational interests and to higher education.

4. Accountability measures should reflect the needs of industry, either through voluntary standards and certification or other outcomes that indicate student performance meets industry needs. In addition, measures should indicate the number of students that enter a career field that correlates with their chosen field of study.

5. Indications of student performance should not be limited to standardized tests but also include alternative forms of assessment that are more reflective of individual learning styles such as career portfolios.

My final comment with regard to Tech Prep and education reform relates to patience. I have been in this business for more years than I care to admit, but I have learned that true and meaningful change in education takes a long time. While Congress and the Administration are anxious to have immediate results, it takes more than one or two years to implement systemic change, and it takes more than one or two years for students to move through a new system and see improved results. Because we have had stability in the Tech Prep program for the past years, we are now seeing students graduate from community colleges and get good jobs. But it takes time and a belief that Tech Prep can make a difference.

On behalf of the thousands of committed Tech Prep practitioners, I urge you to continue Tech Prep as a categorical program in order to keep this great program moving forward. Thank you for the opportunity to testify.

The CHAIRMAN. Mr. Theders, congratulations on what you have done. What can we do at the Federal level or elsewhere to get people to do the same things you have done?

Mr. THEDERS. That came up in a few of the earlier questions, and I think the main thing we would like to offer small business, which I do represent at the AVA, is to just ask for our help. A lot of small businesses are tied up in their own businesses, and do not have the ability, time and talent to go out necessarily and commit to others. As they are asked, they would certainly provide any assistance necessary.

To answer your question, I think that just using the words "vocational education," "technical education," and offering that as an option to all students across the Nation is in itself going to be a big plus. Many of the vocational technical students go on to secondary education and receive their college degrees.

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And we take care of the needs—this is one of my favorite statements when I have an opportunity to share my remarks—life and education and students are like a bell curve. We have talented and gifted on one side; we have the attorneys and public officials and Senators on one side, and on the other side, we have the at-risk students, the emotionally, physically and mentally handicapped. We have programs that take care of both of those.

My concern, and I think a lot of the concerns of moms and dads here today is the fact that the kids are bouncing around in the middle of that bell curve. Vocational technical education in cooperation with a strong curriculum can offer them career options. School-to-work, tech prep, and our association in southwestern Ohio are working together, in harmony, to offer kids career options.

So what can we do? We should most probably talk up the fact that there is absolutely nothing wrong with vocational technical education. It is a step and a path on to lifelong learning, to college, to jobs. What is wrong with work? Not a thing.

The CHAIRMAN. I think that that is an important comments, and I think it gets down to relevance, too. I think that kids in school have got to understand why they are there. The college-bound know why they are there. They have got their eyes set on college, and that is their dream, and the teachers all rally around them. Then you have the group in the middle, so to speak, who do not get much attention; they know they are supposed to learn certain things, but they have no idea why they have to learn them. They do not realize that if you learn these things, you will get a $20 an hour job instead of a $5 an hour job. And I will tell you that that kind of relevancy attracts parents, too, I think. If they know their kid is going to get a $20 an hour job instead of a $5 an hour job, chances are they will not only be happy, but they will leave the house, and that is kind of relevant to everybody.

Mr. Rosenstock, I appreciated your testimony, too. I would like to hear a little bit more about The New Urban High School Project that you are involved with and a few details about it and its success.

Mr. ROSENSTOCK. Well, I am working with well-known national educators like Ted Sizer, Debby Meyer, Howard Fuller, Judith Warren Little, Norton Grubb, and we are trying to find a handful of exemplary urban high schools in the United States that are integrating vocational and academic teaching and learning, integrating work-based and school-based learning, and doing so for all students.

There are 7,400 urban high schools in the country. I wish I could say that there were many more candidates to be finalists than in fact there were. So the first part of my report would have to be one of great concern for the circumstances of urban high schools today.

But that said, we have found some schools that are rather exemplary. One is Hoover High School in San Diego; another is Turner Tech in Miami; another is Chicago Vocational High School; another is the St. Louis Career Academy, and the fifth is Central Park East in East Harlem in New York City.

These are schools that are doing things very differently. I would say that the main reason they wanted to be picked was that they got some money, they got some notoriety, but I think it is worth

noting in the limited time here that the main reason they wanted to be picked was to provide cover locally because it is very fatiguing for them to be at the edge of a contradiction and to be asking for exceptions all the time from what goes on as business as usual and to do the types of things that allow them to do exemplary work. It is rather striking.

The CHAIRMAN. Thank you.

Mr. Hull, you talked about the success of the tech prep program. I would like you to share with us a profile of a student who successfully completes a tech prep program, particularly what happens to that student 4 or 5 years after having completed the program. Do we have any knowledge of what happens?

Mr. HULL. There are very few students who have been in tech prep programs for more than 4 or 5 years because it has not been around that long. There are some pioneering groups that came along before Perkins authorized this, and they are doing very well. The Boeing example is one of a number of very good ones where I would say they are not only meeting the needs from an employability standpoint of knowing academic skills, knowing technical skills and knowing how to work, but they are retrainable.

This is why Boeing invested. They did a cost-benefit analysis and said, "We are not doing this just because we love education; we are doing it because it is going to make Boeing money." I think that education for all these students is a freight train, that you have got to get off and get back on a number of times. Some students will leave after high school and go to work, and they will go back to school, either in a company or in a community college or in a university. I think others will go ahead and move forward. I think we will see a lot more role of employers providing the kind of education that we cannot provide at schools.

Let me mention one thing that was brought out earlier about some international work. This summer, there will be an international tech prep conference in Southeast Asia, in Kuala Lumpur, Malaysia, where I will be giving a keynote speech. Malaysia next year will roll out tech prep throughout the country.

In Turkey, they are going to do a second study. They have already had an international conference for the Mideast in tech prep, and next year they are planning to invest in excess of $100 million in tech prep. In Chile, they are forming a national tech prep network right now, and in Mexico, there are 30 sites in their second year of funding.

So we are finally doing something in this country that other countries want.

The CHAIRMAN. Well, that is our problem. We develop great ideas, and then they get stolen, or adopted, or whatever, immediately in these countries that suddenly recognize the importance of it, and we sputter around, and it takes us a long time to get anybody to change the system and do something different. And now we find ourselves just on the verge of lagging behind our competitors in education, where we have always been the leader. And if we do not get moving and get some replication done and really understand what does work and make sure that everybody out there knows it, so the parents end up demanding it instead of fighting it, we are going to not look too good next century.

Mr. HULL. We are 5 to 7 years ahead of other countries in tech prep. The question now is can we stay there.

The CHAIRMAN. Yes.

Well, I thank you all. I appreciate your patience, and I hope you found this morning's testimony as interesting as I did. This is probably the most critical area facing our country, and I intend to make sure we do everything we can in this committee to do what is necessary to meet the challenge.

All members have permission to enter statements for the record, and with that, the hearing is closed.

[Additional statements submitted for the record follow:]

PREPARED STATEMENT OF NANCY LAY ALLEY, DIRECTOR, INDUSTRIAL SERVICES, OFFICE OF VOCATIONAL AND TECHNICAL EDUCATION, MISSISSIPPI DEPARTMENT OF EDUCATION

Mr. Chairman and distinguished members of the committee, on behalf of the Mississippi State Board of Education I want to thank you for the opportunity to share the exciting educational initiatives that are taking place to reform educational opportunities in Mississippi. Vocational and Technical Education is the driving force behind the major reforms that are underway in our State. Mississippi has taken the Federal focus of Tech Prep and expanded it into a unique educational reform initiative.

Mississippi's Educational Reform Initiative is in response to the challenge of producing highly skilled and productive employees for the 21st century. It is a collaborative effort involving education, business, industry, labor, students, parents, and the entire community.

Mississippi took a major step forward in 1992 by passing legislation that set aside a one percent sales tax increase to be used exclusively to fund educational enhancement. In 1994, the Mississippi Legislature further enhanced educational resources in the State by annually designating half of the ending cash balance in the State's general fund for education. Using Federal Tech Prep funds as seed money, Mississippi made a State commitment of $150 million over a 5- year period to implement the Tech Prep Reform Initiative.

The initiative's major goals are: to improve academic and technical competencies of ALL students through integration of academic and vocational technical education; to develop foundation and adaptive skills for success on the job; to respond to the needs of Mississippi's employers by increasing the number of highly skilled graduates; to ensure a smooth and successful transition from secondary to postsecondary educational programs and the work force; and to increase enrollment in quality educational programs.

A major component contributing to the success of Mississippi's Tech Prep Initiative is the introduction and implementation of technology in the classroom which changes the way instruction is delivered and the way students learn. Placement of high tech labs has cost approximately $300,000 per site. By applying theory to practice, students leave school better prepared to meet the demands of the work force or to continue their education through articulated postsecondary programs and institutions of higher learning.

Tech Prep Discovery courses at the middle school level are one of the most visible components of the initiative. Career exploration and educational planning, applications of technology, problem-solving and decision-making, human relations and teamwork, integration of academic skills, and school-to-work transition are emphasized throughout each course. Courses feature strong academic content in math, science, and communications. Curricula for these courses were developed in conjunction with educators and business and industry through the Research and Curriculum Unit for Vocational and Technical Education housed at Mississippi State University.

All seventh graders participate in Career Discovery, a year-long course that offers exposure to numerous occupations and careers through hands-on activities and interaction with business and community leaders through work groups and guest speakers. Some examples of activities that are included in Career Discovery are: Students practice skills related to careers in manufacturing by working in teams and have the opportunity to actually construct an assembly line product. Students study cause and effect aspects of various environmental areas. They also explore and practice activities directly related to the global economy, marketing, and dis-

tribution by developing a logo, scripting and producing a promotional video and radio spots.

All eighth graders participate in Computer Discovery. Using state-of-the-art, cutting edge computer technologies; laser disc players, CD-ROM, and internet access, students, faculty, and parents are drawn to these labs. Activities in this course include: operation of a variety of software packages, spread sheet development, telecommunications, desktop publishing, and on-line computer research. Eighth graders earn a Carnegie Unit toward high school graduation upon completion of this rigorous curriculum.

All ninth graders participate in Technology Discovery, a course offering state-of-the-art instructional modules that provide hands-on experiences in lasers, robotics, audio/visual communications, biomedical technology, computer-aided drafting and design, electrical and engineering structures, production/processing technology, satellite communications, aerospace technology, computer imaging, environmental technology, and other emerging technologies. Part of the learning process implemented through modular instruction consists of students working in pairs and rotating partners with each module. This concept teaches team involvement and communication skills required by today's industry.

As you can see from the highly technical nature of the curriculum, massive professional development of teachers was required. A major state investment has been made to provide a high level of training using nationally recognized personnel in conjunction with Mississippi teachers. The State has adopted the "teachers teaching teachers" model of professional development, ensuring that the initiative can be sustained using Mississippi trainers. Initial training consisted of detailed instruction in integration of academic and vocational education and the use of classroom technology in math, science, and language arts. The next level of training was to provide the application and technical skills required of teachers in the Discovery courses. A third and vital component of professional development is now in place. Teachers are participating in work place internships during the summer months for first-hand experience that is designed to equip them with the necessary skills to align their teaching methods with industry requirements. This is perceived both by educators and business and industry as a win-win partnership.

A strong counseling component places a career center in each high school for the purpose of providing students with essential information needed to make wise educational and career decisions. Working with the State Occupational Information Coordinating Council (SOICC), the Office of Vocational and Technical Education obtained a statewide license that provides each school in the state of Mississippi with software that can be used by the students to assess both interests and strengths in various occupations. Through an individual Career Educational Plan, students collect information about themselves and develop pathways to enhance their strengths for career interests. This plan is established in the seventh grade for each student and is updated annually through a cooperative process involving the student, counselor, and parent or guardian. All parties must agree to the course of action for the upcoming school year prior to implementation. In addition to the counselor, teachers serve as advisors to the same group of students throughout their school careers to ensure that each student has consistent guidance and communication with a caring adult.

The validation of this initiative is evident through improved student performance on our statewide performance based assessment system. Student scores have increased on all tests in the areas of reading, mathematics, and language arts.

Mississippi also administers the American College Testing (ACT) Work Keys assessments in reading for information, applied mathematics, and locating information. These tests are being administered for the second year to both secondary and postsecondary students. Results should prove to be extremely beneficial to industry when recruiting prospective employees.

Students, teachers, business, and industry are all enthusiastic about the Tech Prep Initiative. It has revitalized classrooms and has had a positive impact on the way students and teachers feel about education. It has linked work force training and education hand-in-hand. Not only does education see the need for involvement with business and industry, but business and industry actively seek involvement in their local educational institutions. Partnerships are in place with agencies like the Mississippi Manufacturers Association and the Associated Builders and Contractors of Mississippi. Key players in the success of the initiative have ranged from small local businesses to nationally recognized manufacturing industries like Ingalls Shipbuilding, Delco-Remy, Chevron, Peavey Electronics, and Georgia Pacific.

Mississippi was privileged to have Senator Jeffords visit last year to witness first-hand the exciting changes taking place in our State. On behalf of the State Board of Education, I would like to take this opportunity to extend a warm invitation to

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each of you to personally visit and experience how Vocational and Technical Education is reforming education and work force training in Mississippi.

[Whereupon, at 12:36 p.m., the committee was adjourned.]

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